COMPAQ

ProLiant ML330 Generation 2 Server

Setup and Installation Guide

First Edition (August 2001)
Part Number 234833-001
Compaq Computer Corporation

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Compaq ProLiant ML330 Generation 2 Server
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About This Guide

This guide is designed to be used as step-by-step instructions for the installation of a Compaq ProLiant ML330 Generation 2 server and as a reference for operation, troubleshooting, and future upgrades.

Server Name

A generation identifier (G2) located on the front of the server indicates the model of the server purchased. The generation identifier is required to accurately identify the model for service and support. Throughout the user documentation, G2 and Generation 2 are used interchangeably.

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Text Conventions

This document uses the following conventions to distinguish elements of text:

Keys	Keys are displayed in boldface. A plus sign (+) between two keys indicates that they should be pressed simultaneously.
USER INPUT	User input is displayed in a different typeface and in uppercase.
FILENAMES	File names are displayed in uppercase italics.
Menu Options, Command Names, Dialog Box Names	These elements are displayed in initial capital letters and may be in boldface for emphasis.
COMMANDS, DIRECTORY NAMES, and DRIVE NAMES	These elements are displayed in uppercase and may be in boldface for emphasis.
Type	When you are instructed to *type* information, type the information **without** pressing the **Enter** key.
Enter	When you are instructed to *enter* information, type the information, and then press the **Enter** key.

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Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings:

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Symbols on Equipment

These symbols may be located on equipment in areas where hazardous conditions may exist:

This symbol, in conjunction with any of the following symbols, indicates the presence of a potential hazard. The potential for injury exists if warnings are not observed. Consult your documentation for specific details.

This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.

This symbol indicates the presence of electric shock hazards. The area contains no user- or field-serviceable parts. Do not open for any reason.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure.

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This symbol, on an RJ-45 receptacle, indicates a network interface connection.

WARNING: To reduce the risk of electric shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching it.

Rack Stability

WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- The stabilizing feet are attached to the rack if it is a single-rack installation.
- The racks are coupled together in multiple-rack installations.
- Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.

⚠ Important Safety Information

Read the *Important Safety Information* document before installing this product.

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Getting Help

If you have a problem and have exhausted the information in this guide, you can obtain further information and other help from the following locations.

Compaq Technical Support

In North America, call the Compaq Technical Support Phone Center at 1-800-OK-COMPAQ. This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.

Outside North America, call the nearest Compaq Technical Support Phone Center. Telephone numbers for worldwide Technical Support Centers are listed on the Compaq website. Access the Compaq website by logging on to the Internet:

http://www.compaq.com

Be sure to have the following information available before you call Compaq:

- Technical support registration number (if applicable)
- Product serial number
- Product model name and number
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level
- Detailed, specific questions

Compaq Website

The Compaq website has information on this product as well as the latest drivers and flash ROM images. You can access the Compaq website by logging on to the Internet:

http://www.compaq.com

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Compaq Authorized Reseller

For the name of your nearest Compaq authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.
- Elsewhere, see the Compaq website for locations and telephone numbers:

  http://www.compaq.com

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Chapter 1

Server Features

The Compaq *ProLiant*™ ML330 Generation 2 server provides the performance, reliability, and ease of ownership you need to allow your business to grow. With support for up to two Intel Pentium III processors (512-K Advanced Transfer Cache), up to four GB of SDRAM, and four 64-bit PCI slots, the ProLiant ML330 Generation 2 server delivers performance that is unmatched in its class. With features like Integrated ATA RAID and a pre-failure warranty on processors, memory, and hard drives, the ProLiant ML330 Generation 2 server is the server you and your business can depend on. And thanks to tools like *SmartStart*™ for Servers software and *Compaq Insight Manager*™ management tool, the ProLiant ML330 Generation 2 server is easy to set up and easy to maintain.

Enjoy your new ProLiant ML330 Generation 2 server!

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Server features include:

- Intel Pentium III processor with 133-MHz front-side system bus
- Dual-processor capability
- 128 MB PC133-MHz ECC Registered SDRAM DIMM, upgradable to 4 GB
- Capacity for five 36.4-GB SCSI hard drives for a maximum of 182 GB of internal storage or four 40-GB ATA hard drives for a maximum of 160 GB of internal storage
- Four removable media bays (three available)
- IDE CD-ROM drive
- 1.44-MB, 3.5-inch diskette drive
- Four 33-MHz 64-bit PCI slots and one 33-MHz 32-bit PCI slot
- Integrated dual-channel Wide Ultra3 SCSI controller or an integrated dual-channel ATA/100 controller
- Integrated PCI 10/100 Wake on LAN network interface controller (NIC)
- Integrated ATI Rage XL video controller
- CE Mark-compliant PFC power supply
- Support for Compaq racks

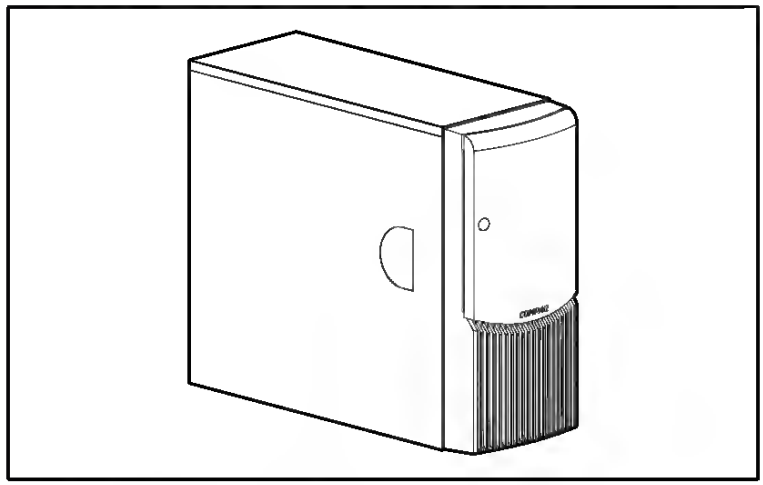

Figure 1-1. Compaq ProLiant ML330 Generation 2 server

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Standard Hardware Features

The following hardware features are standard on the ProLiant ML330 Generation 2 server, unless otherwise noted.

Drive Positions

The ProLiant ML330 Generation 2 server supports a maximum of seven internal drive bays. Figure 1-2 and Table 1-1 show the drive configuration.

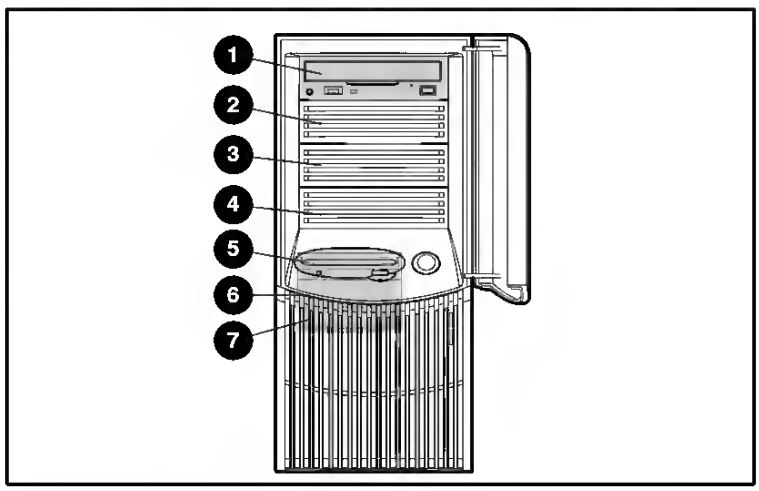

Figure 1-2. Identifying drive positions

Table 1-1
Drive Bay Dimensions

Item	Component	Location	Dimension
❶	IDE CD-ROM drive	Media bay 1	5.25 in x 1.60 in
❷	Available removable media bay	Media bay 2	5.25 in x 1.60 in
❸	Available removable media bay	Media bay 3	5.25 in x 1.60 in
❹	Available removable media bay	Media bay 4	5.25 in x 1.60 in
❺	1.44-MB diskette drive	Hard drive bay 1	3.5 in x 1.0 in
❻	Hard drive bay	Hard drive bay 2	3.5 in x 1.0 in
❼	Hard drive bay	Hard drive bay 3	3.5 in x 1.0 in

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Front Panel Components

Figure 1-3 and Table 1-2 show the front panel components, including buttons and LEDs.

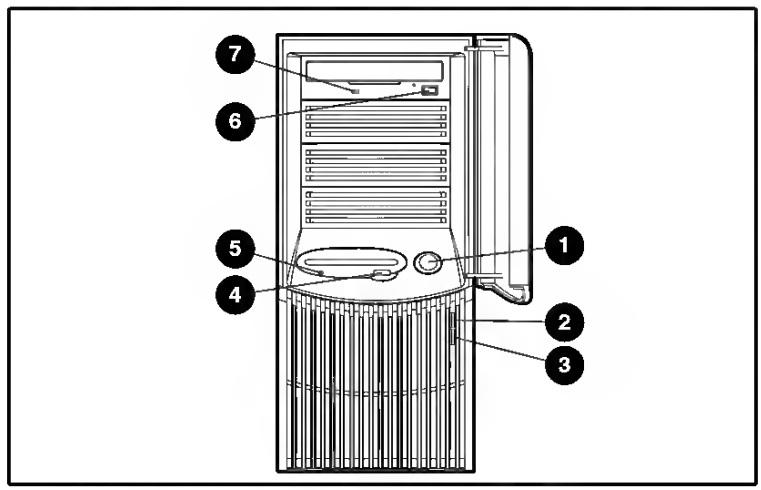

Figure 1-3. Front panel components

Table 1-2
Front Panel Components

Item	Component	Item	Component
❶	Power button	❺	Diskette drive activity LED
❷	Power LED	❻	CD-ROM drive eject button
❸	Hard drive activity LED	❼	CD-ROM drive activity LED
❹	Diskette drive eject button		

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Rear Panel Connectors

Figure 1-4 and Table 1-3 show the rear panel connectors.

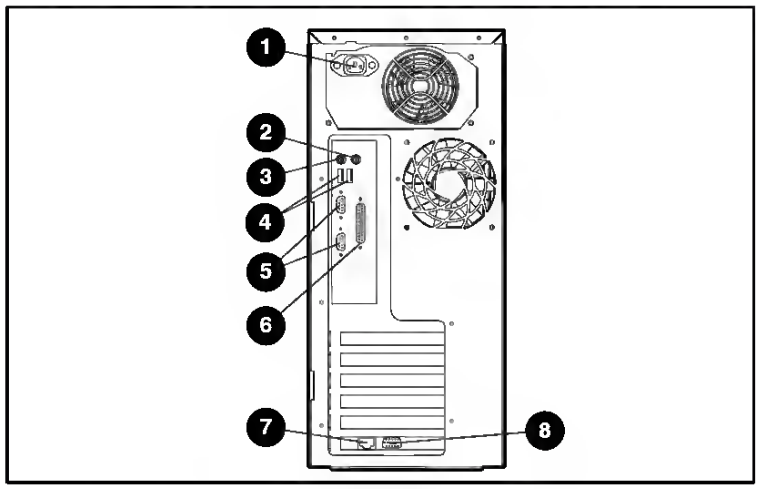

Figure 1-4. Identifying rear panel connectors

Table 1-3
Rear Panel Connectors

Item	Connector	Item	Connector
❶	Power cord	❺	Serial ports
❷	Mouse	❻	Parallel port
❸	Keyboard	❼	RJ-45 Ethernet for NIC
❹	USB ports	❽	Video

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System Board Components

Figure 1-5 and Table 1-4 show the components and connectors of the ProLiant ML330 Generation 2 server system board.

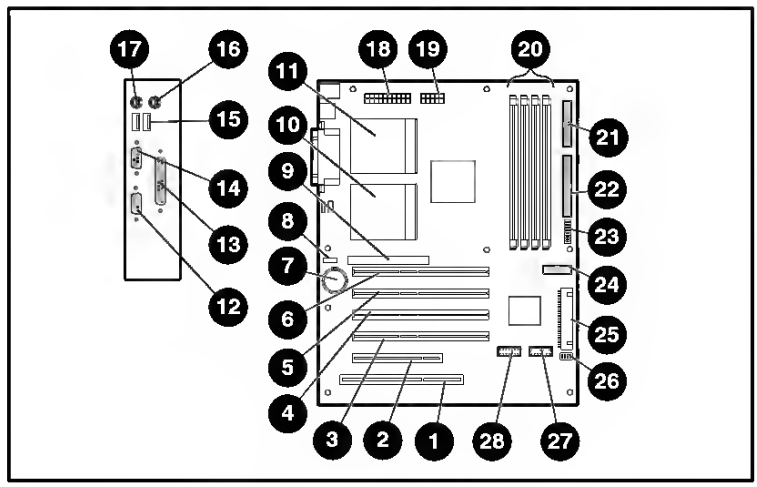

Figure 1-5. Identifying system board components

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Table 1-4
System Board Components

Item	Component	Item	Component
❶	Server Feature Board slot (slot 6)	⓯	USB port connectors
❷	PCI slot 5 (32-bit)	⓰	Mouse connector
❸	PCI slot 4 (64-bit)	⓱	Keyboard connector
❹	PCI slot 3 (64-bit)	⓲	Power supply connector (20-pin)
❺	PCI slot 2 (64-bit)	⓳	Power supply connector (10-pin)
❻	PCI slot 1 (64-bit) (for half-length boards)	⓴	DIMM sockets (four)
❼	Battery	㉑	Diskette drive connector
❽	System fan connector	㉒	Primary IDE channel
❾	Processor Power Module (PPM) 2 slot	㉓	System configuration switch
❿	Processor 2 socket	㉔	Power button connector
⓫	Processor 1 socket	㉕	Secondary IDE channel
⓬	Serial port connector B	㉖	System ID switch
⓭	Parallel port connector	㉗	Remote Insight connector (16-pin)
⓮	Serial port connector A	㉘	Remote Insight connector (30-pin)

Note: For information on system board LEDs and system configuration switch settings, refer to Appendix E, "LED Indicators, Switches, and Jumpers."

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Server Feature Board Components

The following sections detail components and features of the Server Feature Board for both SCSI and ATA models of the ProLiant ML330 Generation 2 server.

Interfaces

- Integrated dual-channel Wide Ultra3 SCSI controller (SCSI model)
- Integrated dual-channel ATA/100 controller (ATA model)
- Integrated PCI 10/100 Wake on LAN NIC

Video

- Integrated ATI Rage XL video controller providing maximum resolution of 1600 x 1200 noninterlaced True Color (32-bit)
- Support for SVGA, VGA, and EGA graphics resolution
- 8-MB SDRAM video memory

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Server Feature Board (SCSI Model)

Figure 1-6 and Table 1-5 show the components of the Server Feature Board for the ProLiant ML330 Generation 2 server with a standard integrated dual-channel Wide Ultra3 SCSI controller.

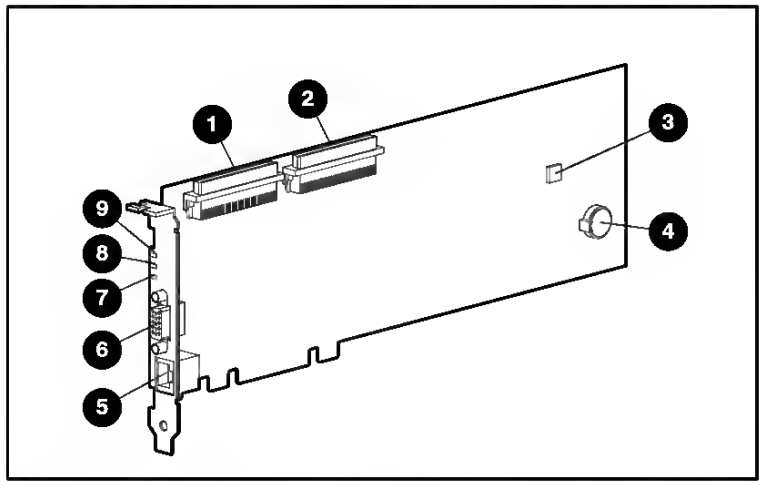

Figure 1-6. Identifying Server Feature Board components (SCSI model)

Table 1-5
Server Feature Board Components (SCSI Model)

Item	Component	Item	Component
❶	SCSI controller channel B	❻	Video connector
❷	SCSI controller channel A	❼	Network speed LED
❸	NMI debug button	❽	Network link LED
❹	Replaceable lithium battery (CR2032)	❾	Network activify LED
❺	RJ-45 Ethernet connector for NIC		

Note: For LED status information, refer to Appendix E, "LED Indicators, Switches, and Jumpers."

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Server Feature Board (ATA Model)

Figure 1-7 and Table 1-6 show the components of the Server Feature Board for the ProLiant ML330 Generation 2 server with a standard integrated dual-channel ATA/100 controller.

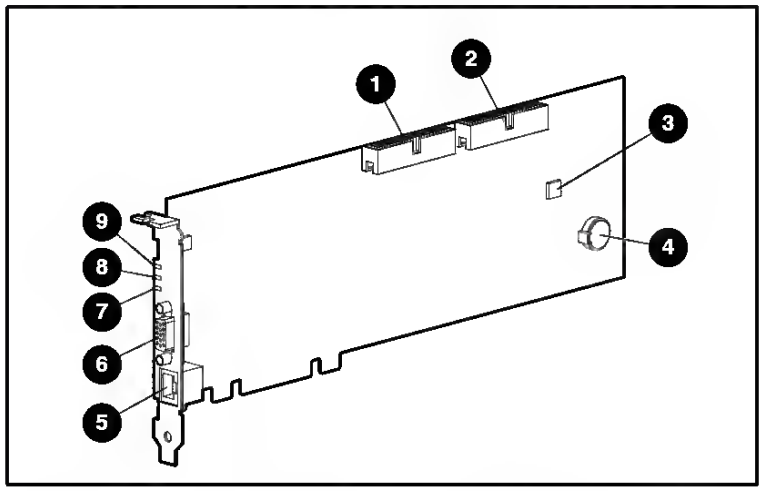

Figure 1-7. Identifying Server Feature Board components (ATA model)

Table 1-6
Server Feature Board Components (ATA Model)

Item	Component	Item	Component
❶	ATA controller channel A (primary)	❻	Video connector
❷	ATA controller channel B (secondary)	❼	Network speed LED
❸	NMI debug button	❽	Network link LED
❹	Replaceable lithium battery (CR2032)	❾	Network activify LED
❺	RJ-45 Ethernet connector for NIC		

Note: For LED status information, refer to Appendix E, "LED Indicators, Switches, and Jumpers."

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Processors and System Memory

- Intel Pentium III processor with 133-MHz front-side system bus
- Dual-processor capability
- ECC for memory error detection and correction
- 128 MB PC133-MHz ECC Registered SDRAM DIMM, expandable to 4 GB
- Support for up to four PC133-MHz ECC Registered SDRAM DIMMs, installed one at a time, in any order

Expansion Slots

- Five expansion slots: one 32-bit PCI slot and four 64-bit PCI slots
- PCI bus that provides peripheral transactions at a bus clock speed of 33 MHz

Storage Controller

- Integrated dual-channel Wide Ultra3 SCSI controller on the PCI local bus (SCSI model). The controller provides two internal SCSI buses.
- Integrated dual-channel ATA/100 controller (ATA model)
- Optional controller boards for controller duplexing or expanding storage capacity available

Network Controller

- Integrated PCI 10/100 Wake on LAN NIC
- Preboot Execution Environment (PXE) support for installing and configuring operating systems remotely

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Ports/Connectors

- Serial (2)
- Parallel
- Keyboard
- Mouse
- USB (2)

Power Supply

- CE Mark-compliant PFC power supply

Warranty

The Compaq Pre-Failure Warranty helps prevent unplanned shutdowns of the system by allowing for the replacement of covered parts before they fail. The warranty covers processors, memory, and hard drives. Compaq Insight Manager, included with the system, must be installed for the Compaq Pre-Failure Warranty to be in effect.

When Compaq Insight Manager alerts you that a component may be eligible for Pre-Failure Warranty replacement, follow the onscreen instructions or contact a Compaq authorized service provider in your area. A yellow status indicator on the Compaq Insight Manager control panel signals that a component is in a pre-failure condition and should be replaced.

Consult the Compaq Customer Support Center or refer to the Limited Warranty Statement included with your server for details. Certain restrictions and exclusions apply. For additional warranty information, visit the Compaq website at

http://www.compaq.com/support/

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Server Configuration and Management

The ProLiant ML330 Generation 2 server offers an extensive set of features and optional tools to support effective server management and configuration, which may include:

- ROM Based Setup Utility (RBSU)—performs a wide range of system configuration activities
- *ROMPaq*™ utility—upgrades the firmware (BIOS) by flashing the system ROM and provides redundant ROM support in case of ROM corruption
- Compaq SmartStart for Servers software—provides driver updates and assisted operating system installation
- Compaq Insight Manager management tool—monitors fault conditions, server performance, security, and more
- Compaq Diagnostics utility—tests and verifies the operation of Compaq hardware
- Automatic Server Recovery-2 (ASR-2)—automatically resets a server that has not responded in a select amount of time or has reached a dangerous temperature
- Compaq Survey Utility—allows you to keep a historical record of server hardware and software changes in a single configuration history file
- Power-On Self-Test—checks firmware and assemblies during system startup to ensure that the system is functioning properly
- Integrated ATA RAID Configuration Utility (ATA model)—supports, configures, and manages ATA hard drive arrays

See Chapter 5, "Server Configuration and Utilities," or Chapter 6, "RAID Configuration and Management," for detailed information on each of these utilities.

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Security

Security features for the ProLiant ML330 Generation 2 server include:

- Power-on password
- Administrator password
- Network server mode
- Diskette write control
- Quicklock
- Redundant ROM support

Most security features are established through RBSU. See Chapter 5, "Server Configuration and Utilities," or the *Compaq ROM Based Setup Utility User Guide*, for detailed information on RBSU. For additional information concerning server security features, refer to the SmartStart for Servers CD included in the shipping box.

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Chapter 2

Overview of Server Installation

The following instructions are provided as an overview for first-time installation of your Compaq ProLiant ML330 Generation 2 server. If you have any problems, contact your Compaq authorized reseller.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Disconnect power from the server by unplugging the power cord from either the electrical outlet or the server.
- Do not place anything on power cords or cables. Arrange them so that no one can accidentally step on or trip over them. Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Make sure that you are properly grounded (earthed) before beginning any installation procedure. See Appendix B, "Electrostatic Discharge," for more information.

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Selecting a Site

Make sure that the installation area you select has the following features:

- A sturdy, level site that includes dedicated and properly grounded (earthed) circuits, air conditioning, and ESD protection
- 7.6 cm (3.0 inches) clearance on all sides of tower server for proper ventilation

IMPORTANT: See the following section, "Installing the Rack Server," for clearance specifications if you are installing the ProLiant ML330 Generation 2 server into a rack.

- A separate electrical circuit for the server

CAUTION: Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.

To purchase a UPS, contact your local Compaq authorized reseller or visit the Compaq website at

http://www.compaq.com/products/storageworks/powerprotection.html

Refer to Appendix F, "Specifications," for detailed power and temperature requirements.

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Installing the Rack Server

The ProLiant ML330 Generation 2 server offers optional support for Compaq and some third-party rack solutions. This section provides an overview of the rack enabling option, as well as environmental information required for the installation of a rack-mounted server.

Rack Enabling Option

Figure 2-1 shows the ProLiant ML330 Generation 2 server installed into a rack.

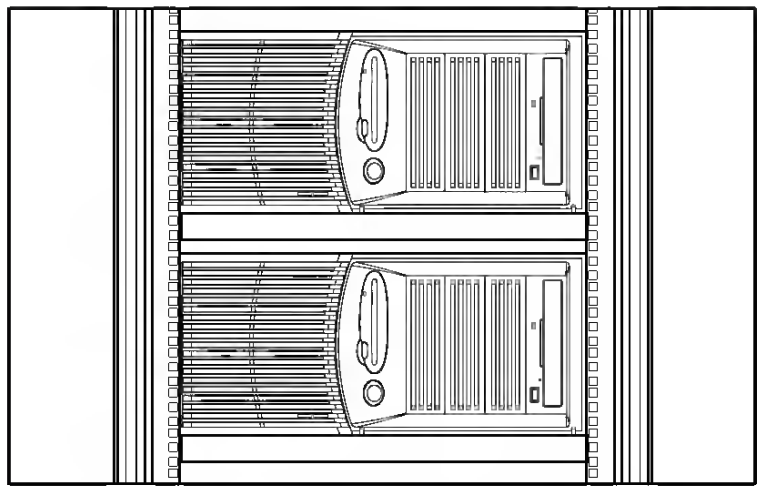

Figure 2-1. The ProLiant ML330 Generation 2 server installed into a rack

To purchase the rack enabling kit (Part Number 238547-B21), contact your local Compaq authorized reseller.

A selection of racks for your server can be purchased through your Compaq authorized reseller or online at

http://www.compaq.com/storage/

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Rack Environment

To allow for servicing and adequate airflow, observe the following spatial requirements when selecting a site for your rack-mounted server:

- Leave a minimum clearance of 63.5 cm (25.0 inches) in front of the rack.
- Leave a minimum clearance of 76.2 cm (30.0 inches) behind the rack.
- Leave a minimum clearance of 121.9 cm (48.0 inches) from the back of the rack to the back of another rack or row of racks.

Compaq servers draw in cool air through the front door of the rack and expel warm air through the rear door. Therefore, the front door must be adequately ventilated to allow ambient room air to enter the cabinet, and the rear door must be adequately ventilated to allow the warm air to escape from the cabinet.

IMPORTANT: Do not block the ventilation openings.

When there is any vertical space in the rack not filled by a server or rack component, the gaps between the components cause changes in airflow through the rack and across the servers. Cover all gaps with blanking panels to maintain proper airflow.

CAUTION: Always use blanking panels to fill empty vertical spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

CAUTION: When using a Compaq 7000 Series rack, you must install the high-airflow rack door insert [Part Number 327281-B21 (42U) and Part Number 157847-B21 (22U)] to provide proper front-to-back airflow and cooling and prevent damage to the equipment.

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Compaq 9000 Series racks provide proper server cooling from flow-through perforations, ensuring 64 percent open area for ventilation. Refer to the rack documentation provided with Compaq 7000 Series racks for guidelines on meeting airflow requirements.

CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

- Front and rear doors: if your 42U server rack includes closing front and rear doors, you must allow 5,350 sq cm (830 square inches) of holes evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).
- Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 7 cm (2.75 inches).

For additional information and instructions on installing your server into a rack, refer to your rack enabling kit documentation.

Locating Materials

Locate the following materials that were shipped with your ProLiant ML330 Generation 2 server:

- Keyboard
- Mouse
- Power cord
- Documentation and software packs inside the shipping box

In addition to these supplied items, you may need:

- Torx T-15 screwdriver
- Phillips #2 screwdriver
- Hardware options
- Uninterruptible power supply (UPS)
- Ethernet cable
- Monitor
- Application software

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Installation Sequence

Observe the following cautions before beginning any installation procedures:

CAUTION: If your server has a factory-installed operating system, prevent data loss by configuring the server using the instructions in the following section, "Factory-Installed Operating Systems." If the operating system was not factory-installed, follow the instructions in the "Operating Systems Purchased Separately" section later in this chapter.

CAUTION: Before powering up the server, make sure that the power cord and all cables have been properly connected or server data could be lost.

Factory-Installed Operating Systems

If you ordered your server with a factory-installed operating system, everything required to install your operating system is already on the server. Refer to the steps provided in the *Compaq Factory-Installed Operating System Software User Guide*.

To install your server:

IMPORTANT: Follow these instructions before installing any additional hardware.

1. Review and follow the guidelines and procedures in the previous sections of this chapter.
2. Connect the power cord and any peripheral devices. See Chapter 1, "Server Features," for the location of all rear panel connectors.

WARNING: To reduce the risk of electric shock or fire, do not plug telecommunications/telephone connectors into the network interface controller (NIC) receptacle.

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3. After the cables have been connected, you are ready to power up the ProLiant ML330 Generation 2 server. To power up your server:
   a. Press and release the circular indentation on the left side of the drive bay door to release the door latch ❶.
   b. Swing the drive bay door open ❷.
   c. Press the power button on the front of the server ❸.

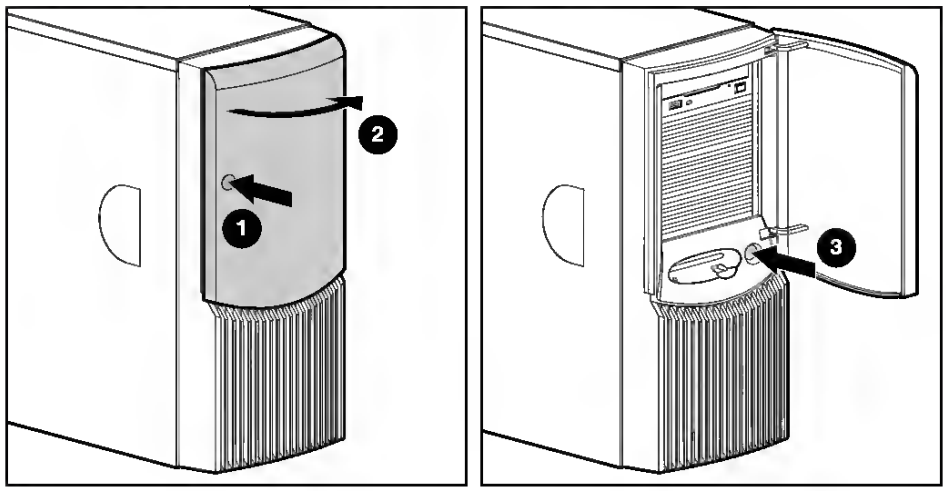

Figure 2-2. Powering up the server

4. Follow the onscreen instructions to complete the factory-installed operating system initialization process. After initialization is complete, the server automatically goes through Power-On Self-Test (POST).
5. To manage the server, install Compaq Insight Manager, found on the Compaq Management CD. For Compaq Management CD initialization procedures, refer to the Server Setup and Management pack shipped with your server.

IMPORTANT: You must install and use Compaq Insight Manager to benefit from the Compaq Pre-Failure Warranty on processors, hard drives, and memory modules.

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6. After verifying your server configuration, back up your system configuration. Refer to the **System Configuration Utility** menu on the SmartStart CD for further information on backing up your system configuration.
7. Install any additional hardware. See Chapter 3, "Hardware Options Installation," or the option kits, for detailed instructions on installing internal hardware
8. Install any application software.
9. Register your server. See the section "Server Registration," later in this chapter, for details.

Operating Systems Purchased Separately

If you purchased your operating system separately, you must install it using the SmartStart CD. Refer to the Server Setup and Management pack for instructions on using SmartStart. The first time the server is configured, the SmartStart program automatically creates a necessary partition on your hard drive. This partition cannot be used for any other purpose and is not a traditional system partition.

Follow this sequence when installing your operating system for the first time:

1. Review all guidelines listed from the beginning of this chapter through the "Locating Materials" section.
2. Install any hardware options. See Chapter 3, "Hardware Options Installation," or the option kits, for detailed instructions on installing internal hardware.
3. Connect the power cord and any peripheral devices. See Chapter 1, "Server Features," for the location of all rear panel connectors.

WARNING: To reduce the risk of electric shock or fire, do not plug telecommunications/telephone connectors into the network interface controller (NIC) receptacle.

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4. Power up the server. See step 3 of "Factory-Installed Operating Systems" for instructions.
5. To select the type of operating system and set the date and time, run ROM Based Setup Utility (RBSU) by pressing the **F9** key when prompted during initial boot.

   For more information on RBSU, see Chapter 5, "Server Configuration and Utilities," or refer to the *Compaq ROM Based Setup Utility User Guide*.
6. Insert the SmartStart CD into the CD-ROM drive. Refer to "Configuring the Server" in the following section for instructions. For SmartStart CD initialization procedures, refer to Chapter 5, "Server Configuration and Utilities," or the Server Setup and Management pack shipped with your server.
7. Install the operating system software.
8. To manage the server, install Compaq Insight Manager, found on the Compaq Management CD. For Compaq Management CD initialization procedures, refer to the Server Setup and Management pack shipped with your server.

   IMPORTANT: You must install and use Compaq Insight Manager to benefit from the Compaq Pre-Failure Warranty on processors, hard drives, and memory modules.
9. Install any application software needed.
10. Register your server. See the section "Server Registration," later in this chapter, for details.

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Configuring the Server

The server setup utility, RBSU, can be used to configure the server and options. To initiate RBSU, press the **F9** key when prompted during start up.

The SmartStart CD contains ROMPaq and updated drivers, and assists with operating system installation. To use the SmartStart CD:

1. Locate the SmartStart CD in the Server Setup and Management pack.
2. After you power up the server, press the CD-ROM drive eject button.
3. Insert the SmartStart CD into the CD-ROM drive with the labeled side up. Handle the CD by its edges, not by the flat surfaces of the disc.

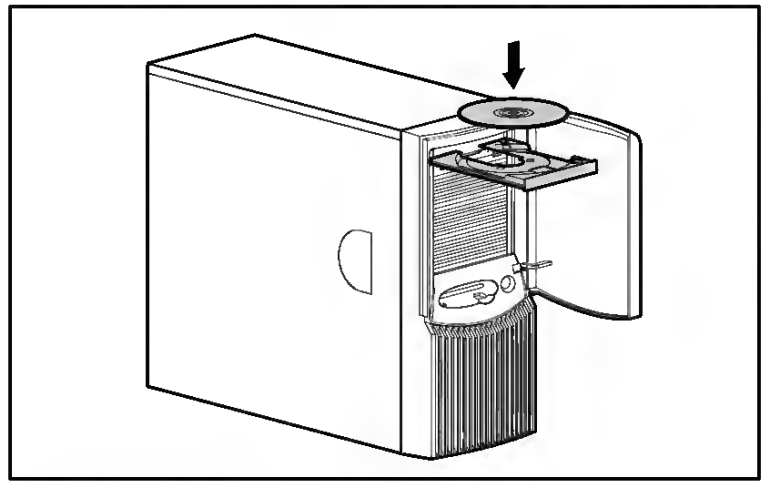

Figure 2-3. Inserting a CD into the CD-ROM drive

4. When the busy indicator turns green, the SmartStart sequence begins. Refer to the SmartStart CD for more information.

Server Registration

For server registration information, refer to the Server Setup and Management pack shipped with the server or visit the Compaq website:

http://www.compaq.com/register

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Chapter 3

Hardware Options Installation

This chapter provides procedures for installing, removing, and replacing hardware options for the Compaq ProLiant ML330 Generation 2 server.

WARNING: There is a risk of personal injury from hazardous energy levels. The installation of options and the routine maintenance and service of this product must be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with equipment containing hazardous energy circuits.

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Make sure that you are properly grounded (earthed) before beginning any installation procedure. See Appendix B, "Electrostatic Discharge," for more information.

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Preparing the Server

Powering Down the Server

Before installing or removing any options, prepare your server by following these steps:

CAUTION: Failure to follow these instructions could result in damage to equipment or loss of information.

1. Back up your server data and record configuration information.
2. Shut down the operating system as directed in your operating system instructions.
3. Power down the server by pressing the power button on the front of the server.
4. Remove the power cord.

WARNING: To reduce the risk of injury from electric shock or damage to the equipment when installing hardware, make sure that the power to the server is turned off. Remove any AC power cords to completely disconnect power from the system. The front panel power button may not completely remove power to the server.

5. Disconnect any other external equipment connections to the server.

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Removing the Front Bezel

To remove the front bezel:

> **CAUTION:** To prevent damage to equipment or loss of information, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the front bezel.

1. Follow the steps in "Powering Down the Server" earlier in this chapter.
2. Pull up on the latch at the bottom of the front bezel, applying enough pressure to release the latch from the chassis ❶.
3. Swing the bezel upward, and then slide it out and away from the chassis ❷. You may need to exert a small amount of force to release the bezel from the chassis.

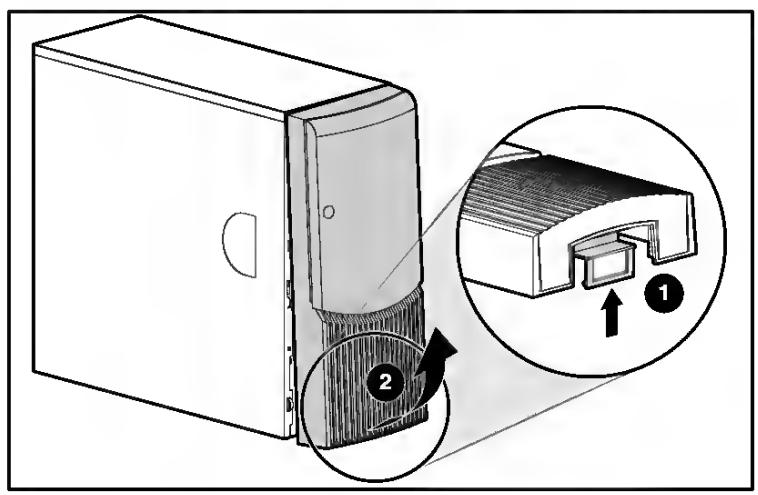

Figure 3-1. Removing the front bezel

To replace the front bezel, reverse steps 2 and 3.

> **NOTE:** When replacing the front bezel, make sure that the top hinge points are properly placed in the chassis before rotating the front bezel into its original position.

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Removing the Access Panel

To remove the access panel:

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

CAUTION: To prevent damage to equipment or loss of information, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the access panel.

CAUTION: Do not operate the server while the access panel is removed. This panel is an integral part of the cooling system and removing the panel while the system is running may adversely affect data integrity.

1. Follow the procedures in "Powering Down the Server" and "Removing the Front Bezel" earlier in this chapter.
2. Remove the screw located on the left side of the front chassis ❶.
3. Slide the access panel forward, pull from the top of the access panel, and then lift the panel from the chassis ❷.

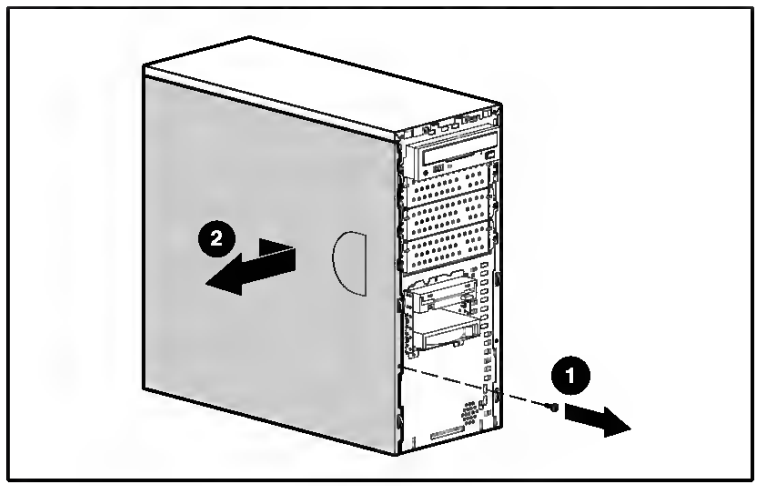

Figure 3-2. Removing the access panel

NOTE: Turn the access panel over to locate the System Configuration label. This label provides information about the system board of the ProLiant ML330 Generation 2 server.

To replace the access panel, reverse steps 2 and 3.

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Removing Bezel Blanks

When installing a device into a removable media bay, it is sometimes necessary to remove the corresponding bezel blank from the front bezel. To remove a bezel blank:

CAUTION: To prevent damage to equipment or loss of information, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the front bezel.

NOTE: It is not necessary to remove a bezel blank when installing a hard drive into a removable media bay.

1. Follow the procedures in "Powering Down the Server" and "Removing the Front Bezel," earlier in this chapter.
2. On the back of the front bezel, pinch the tabs on each end of the bezel blank toward each other ❶, and then push the bezel blank through the front bezel ❷.

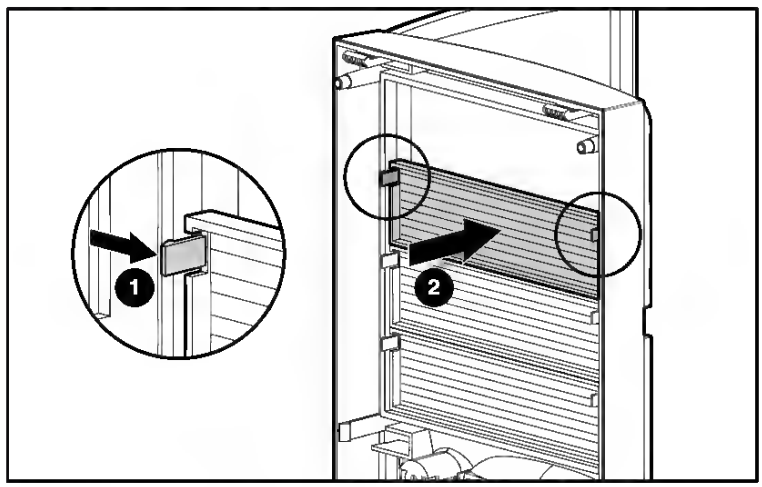

Figure 3-3. Removing a bezel blank

To replace a bezel blank, reverse steps 1 and 2.

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Removing a Drive Tray

NOTE: The drive trays in the removable media bays can be used to mount internal 3.5-inch hard drives. The rails mounted inside the drive trays can be removed and used to mount other devices in the removable media bays.

When installing a device into a removable media bay, it is necessary to first remove the drive tray. To remove a drive tray from a removable media bay:

1. Follow the steps in "Removing the Access Panel" earlier in this chapter.
2. Remove the screws on each side of the drive tray ❶.
3. Gently slide the drive tray out of the front of the chassis ❷.

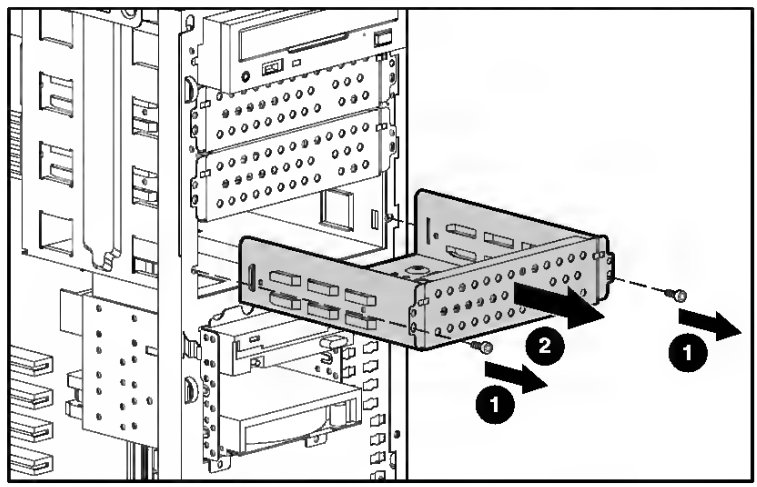

Figure 3-4. Removing a drive tray

To replace a drive tray, reverse steps 2 and 3.

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Storage Devices

This section covers removal and replacement procedures for the storage devices supported by the ProLiant ML330 Generation 2 server.

See Chapter 1, "Server Features," for the location and dimensions of the server drive bays, before installing a device.

CAUTION: To prevent damage to equipment or loss of information, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the front bezel or access panel.

IMPORTANT: When you add or remove a component or change a security feature, you must reconfigure the server to recognize these changes. If the system configuration is incorrect, your server will not work properly and you may receive error messages on the screen.

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Installing a Hard Drive

To install a 3.5-inch hard drive:

1. Follow the steps in "Removing the Access Panel" earlier in this chapter.
2. Disconnect the power and data cables from the back of all devices located in the hard drive compartment.
3. Remove the three shipping screws ❶, press the tabs on each side of the drive compartment ❷, and then pull the drive compartment from the chassis ❸.

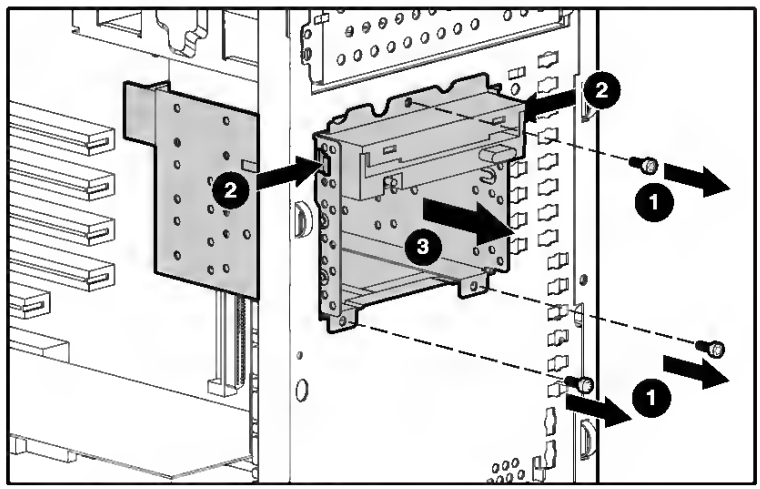

Figure 3-5. Removing the drive compartment

4. Configure the device.
   - For SCSI devices, set the SCSI ID on the drive. You must manually set the SCSI ID on each device to a unique value in the range of 0 to 6 for each SCSI bus. Refer to the documentation provided with the device for instructions on how to set the SCSI ID.
   - For ATA devices, make sure that the jumper on the drive is set to Cable Select (CS) so that the primary and secondary drives are determined by the cable. Refer to Chapter 4, "Cabling Guidelines," for further information.

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5. If applicable, remove all terminating jumpers from third-party SCSI devices (Compaq SCSI cables are terminated).

   NOTE: Using a non-Ultra3 drive impacts the SCSI bus performance of the ProLiant ML330 Generation 2 server.

6. Slide the drive into the drive bay ❶, and then secure with two screws on each side of the drive compartment ❷.

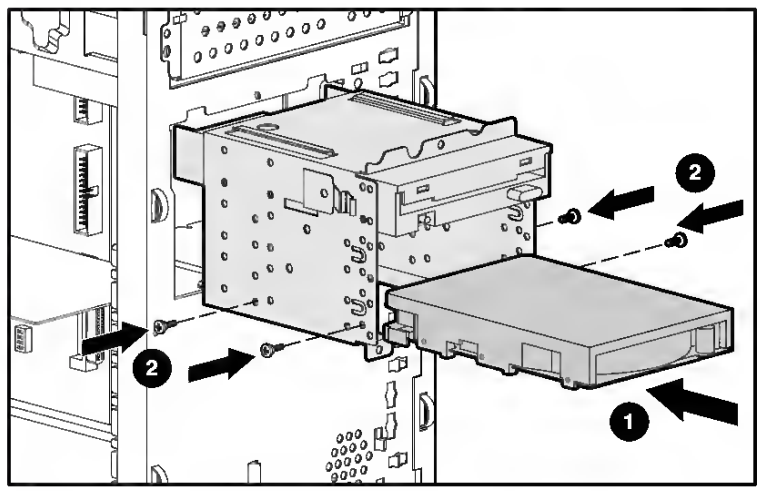

Figure 3-6. Installing a 3.5-inch hard drive

7. Slide the drive compartment back into the chassis, and then replace the three shipping screws.
8. Connect the power and data cables to the back of all devices. See Chapter 4, "Cabling Guidelines," for cabling information specific to your server model.
9. Replace the access panel and the front bezel.
10. Restore power to the server.

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Removing a Hard Drive

To remove a 3.5-inch hard drive:

1. Follow the steps in "Removing the Access Panel" earlier in this chapter.
2. Disconnect the power and data cables from the back of all devices in the hard drive compartment.

Figure 3-7 shows cable removal procedures for SCSI models.

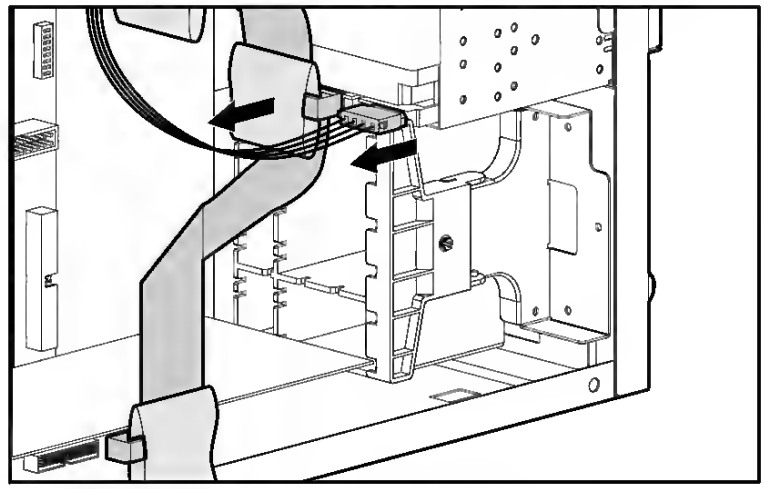

Figure 3-7. Disconnecting the hard drive cables (SCSI model)

Figure 3-8 shows cable removal procedures for ATA models.

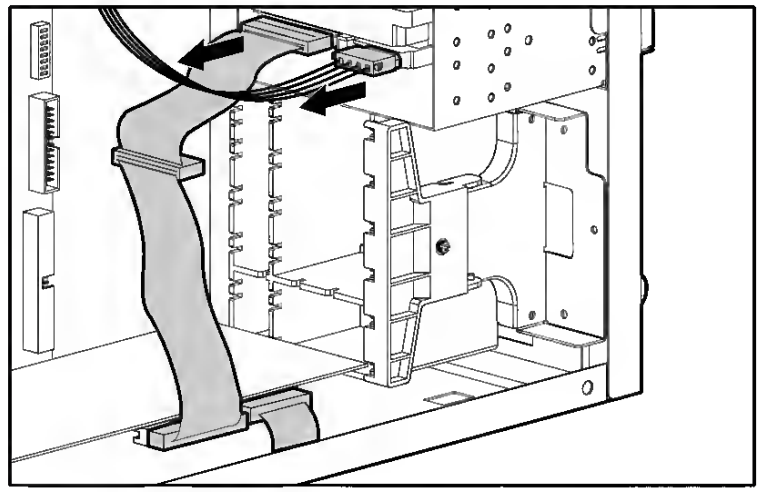

Figure 3-8. Disconnecting the hard drive cables (ATA model)

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3. Remove the three shipping screws, press the tabs on each side of the drive compartment, and then pull the drive compartment from the chassis as shown in Figure 3-5.

4. Remove the two screws on each side of the drive ❶, and then gently pull the drive out of the drive bay ❷ as shown in Figure 3-9.

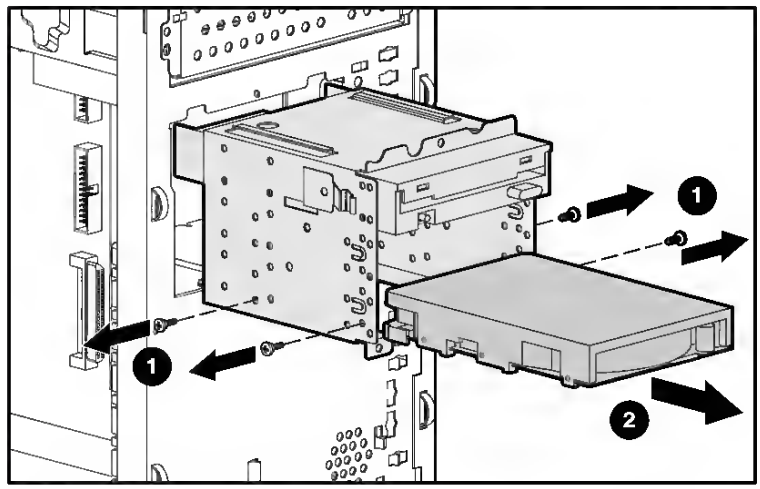

Figure 3-9. Removing a hard drive

5. Slide the drive compartment back into the chassis, and then replace the three hard drive compartment shipping screws.

6. Connect the power and data cables to the back of all devices.

7. Replace the access panel and the front bezel.

8. Restore power to the server.

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Installing a Hard Drive into a Removable Media Bay

IMPORTANT: If you are installing a hard drive into a removable media drive bay, you must use a drive tray. Drive trays are found in each removable media bay. See "Removing a Drive Tray" earlier in this chapter.

To install a hard drive using a drive tray:

1. Follow the steps in "Preparing the Server" earlier in this chapter.
2. Set the drive into the drive tray ❶.
3. Tighten the four screws on the bottom of the drive tray to secure the drive into the drive tray ❷.

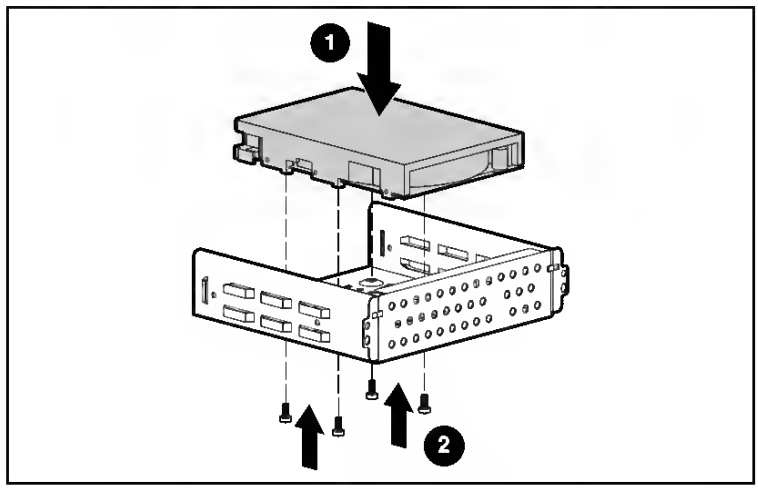

Figure 3-10. Installing a hard drive into a removable media bay drive tray

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4. Slide the drive tray into the removable media bay ❶, and then secure with a screw on each side of the drive tray ❷, as shown in Figure 3-11.

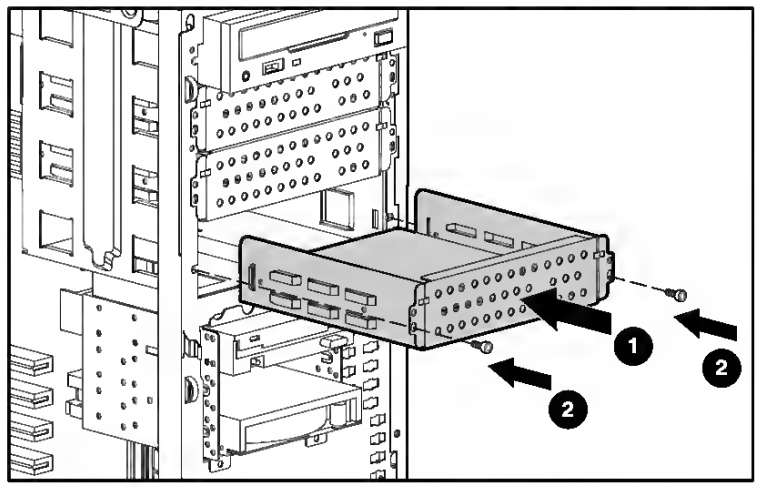

Figure 3-11. Installing a hard drive into a removable media bay

5. Connect the power and data cables to the back of all devices. See Chapter 4, "Cabling Guidelines," for cabling information specific to your server model.
6. Replace the access panel and the front bezel.
7. Restore power to the server.

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Installing a Tape Drive

IMPORTANT: When installing a tape drive, remove the rails included in the drive tray and install them onto the tape drive, replacing any existing rails. The rails are secured to the drive tray with two screws on each rail.

NOTE: If installing an ATAPI tape drive, see "Cabling an ATAPI Tape Drive" in Chapter 4, "Cabling Guidelines," for specific cabling information.

To install a tape drive:

1. Follow the steps in "Preparing the Server" earlier this chapter.
2. Configure the device.
   - For SCSI devices, set the SCSI ID on the drive. You must manually set the SCSI ID on each device to a unique value in the range of 0 to 6 for each SCSI bus. Refer to the documentation provided with the device for instructions on how to set the SCSI ID.
   - For ATA devices, make sure that the jumper on the drive is set to Cable Select (CS) so that the primary and secondary drives are determined by the cable. Refer to Chapter 4, "Cabling Guidelines," for further information.
3. Remove the rails from the drive tray, and then install them onto the tape drive.

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4. Slide the drive into the drive bay, as shown in Figure 3-12.

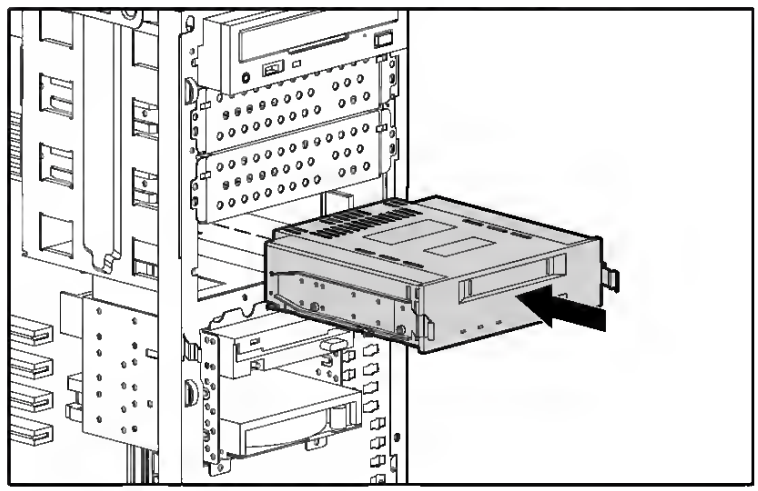

Figure 3-12. Installing a tape drive

5. Connect the data and power cables to the back of the drive, as instructed in Chapter 4, "Cabling Guidelines."
6. Replace the access panel and the front bezel.
7. Restore power to the server.

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Installing a Device into a Removable Media Bay

All ProLiant ML330 Generation 2 server models ship standard with four removable media bays. The top 5.25-inch bay is occupied by an IDE CD-ROM drive. The remaining three 5.25-inch bays are available for removable media devices. You can install three half-height devices, or one full-height device and one half-height device, into these bays.

To install a 5.25-inch device:

1. Follow the steps in "Preparing the Server" earlier in this chapter.
2. Configure the device.
   - For SCSI devices, set the SCSI ID on the drive. You must manually set the SCSI ID on each device to a unique value in the range of 0 to 6 for each SCSI bus. Refer to the documentation provided with the device for instructions on how to set the SCSI ID.
   - For ATA devices, make sure that the jumper on the drive is set to Cable Select (CS) so that the primary and secondary drives are determined by the cable. Refer to Chapter 4, "Cabling Guidelines," for further information.
3. If applicable, remove all terminating jumpers from third-party SCSI devices (Compaq SCSI cables are terminated).
4. Set the drive into the drive tray, and then secure with screws, as shown in Figure 3-10.
5. Slide the device into the drive bay, and then secure with screws on each side of the device, as shown in Figure 3-11.
6. Connect the data and power cables to the back of the device. See Chapter 4, "Cabling Guidelines," for cabling information specific to your server model.
7. Replace the access panel and the front bezel.
8. Restore power to the server.

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Removing a Hard Drive or Other Device from a Removable Media Bay

To remove a device from a removable media bay:

1. Follow the steps in "Removing the Access Panel" at the beginning of this chapter.
2. Disconnect the power and data cables from the back of the device.
3. Remove the screws on each side of the device ❶, and then gently slide the device out from the front of the chassis ❷.

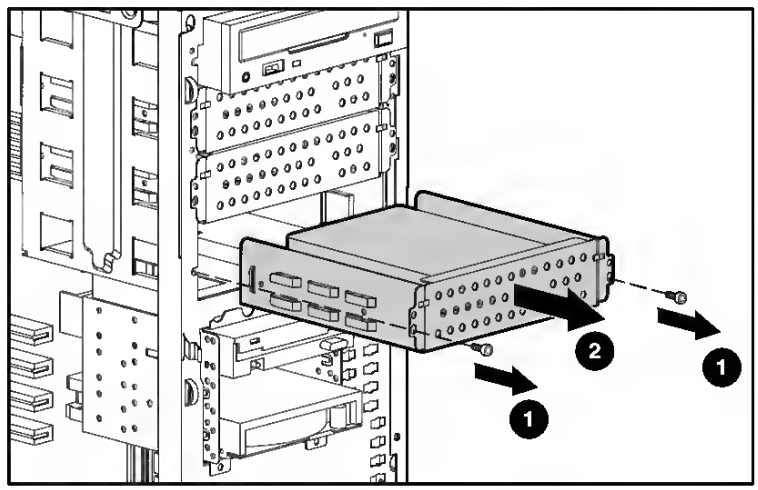

Figure 3-13. Removing a device from the removable media bay

4. Install another device or a drive tray. Replace the bezel blank (or blanks) if no device is installed. See "Removing Bezel Blanks" and "Removing a Drive Tray" earlier in this chapter.
5. Replace the access panel and the front bezel.
6. Restore power to the server.

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Installing an Expansion Board

Figure 3-14 and Table 3-1 identify the location of expansion slots.

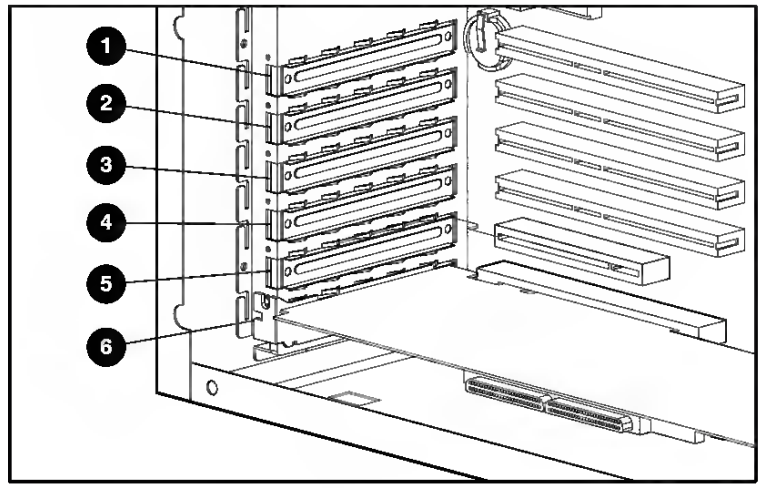

Figure 3-14. Locating expansion slots

Table 3-1
Expansion Slots

Item	Slot Type	Slot Number
❶	64-bit PCI (for half-length boards)	1
❷	64-bit PCI	2
❸	64-bit PCI	3
❹	64-bit PCI	4
❺	32-bit PCI	5
❻	Server Feature Board slot	6

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To install an expansion board:

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Make sure that you are properly grounded (earthed) before beginning any installation procedure. See Appendix B, "Electrostatic Discharge," for more information.

1. Follow the steps in "Removing the Access Panel" earlier in this chapter.
2. From inside the chassis, push the expansion slot cover through the rear of the chassis as shown in Figure 3-15.

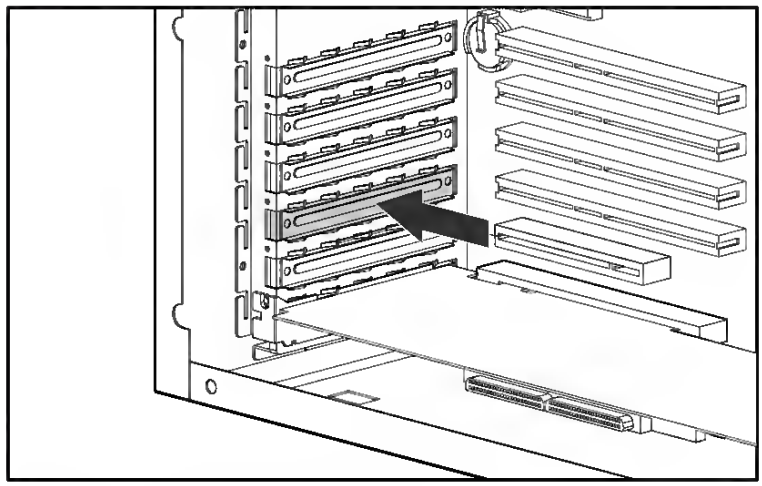

Figure 3-15. Removing the expansion slot cover

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3. Release the expansion board retainer by loosening the screw ❶ and pivoting the retainer back towards the front of the chassis ❷, as shown in Figure 3-16.

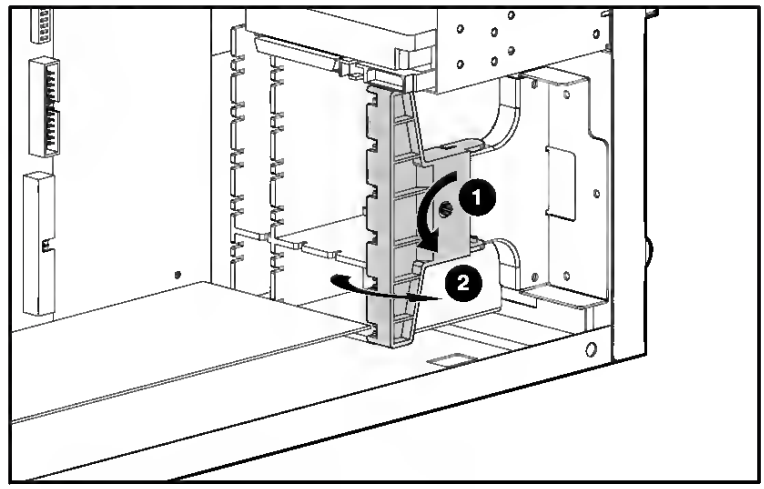

Figure 3-16. Releasing the expansion board retainer

IMPORTANT: Be sure to insert expansion boards into the appropriate type of expansion slot. The 32-bit expansion boards should be inserted into 32-bit slots, and the 64-bit expansion boards must be inserted into 64-bit expansion slots.

4. Insert the expansion board into the slot, and then secure with a screw on the top of the board.

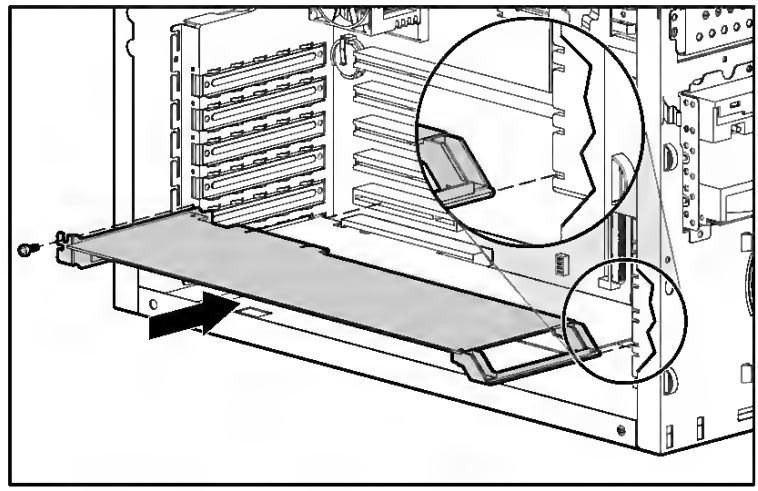

Figure 3-17. Installing an expansion board

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5. Connect any cables to the expansion board.
6. Reinstall the expansion board retainer by reversing step 3.

To remove an expansion board, reverse steps 1 through 5.

Memory Modules

Technical Information and Important Guidelines

CAUTION: To prevent damage to equipment or loss of information, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the access panel.

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Make sure that you are properly grounded (earthed) before beginning any installation procedure. See Appendix B, "Electrostatic Discharge," for more information.

CAUTION: When handling a DIMM, be careful not to touch any of the contacts. Doing so may damage the component.

When installing DIMMs, you must follow these guidelines:

- Memory modules must be industry standard, 168-pin, PC133-MHz ECC Registered SDRAM DIMMs and support CAS Latency 3 (CL=3).
- Do not mix ECC and non-ECC SDRAM DIMMs. If different types of DIMMs are mixed, the system will not properly function.

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Installing a Memory Module

The ProLiant ML330 Generation 2 server supports PC133-MHz ECC Registered SDRAM DIMMs. Additional DIMMs are available to upgrade the memory. The server has four DIMM sockets located on the system board.

NOTE: DIMMs can be installed in any sequence and do not have to be installed in pairs.

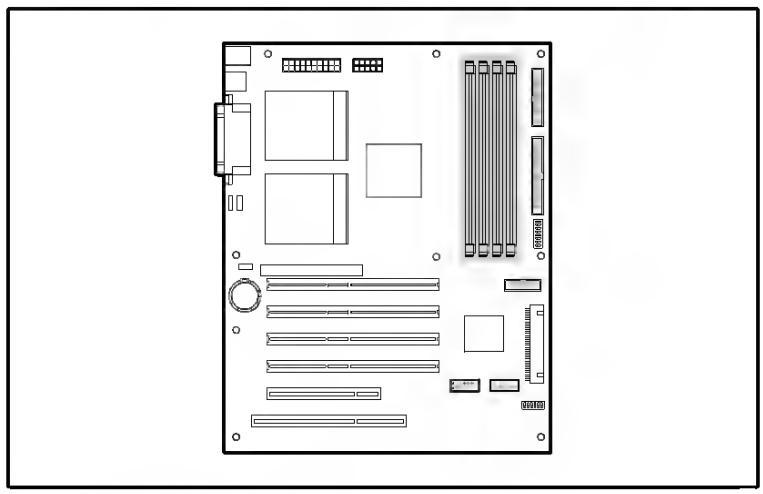

Figure 3-18. Locating DIMM sockets

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To install a DIMM:

1. Follow the steps in "Removing the Access Panel" at the beginning of this chapter.
2. Press outward on both latches of the DIMM socket at the same time ❶.
3. Insert the DIMM into the socket ❷.

CAUTION: A DIMM can be installed only one way or damage will result. Be sure to match the two key slots on the DIMM with the tab on the DIMM socket. Push the DIMM down into the socket, ensuring that it is fully inserted and properly seated.

4. Return latches to the upright position ❸.

NOTE: The latches may automatically close when the DIMM is properly inserted.

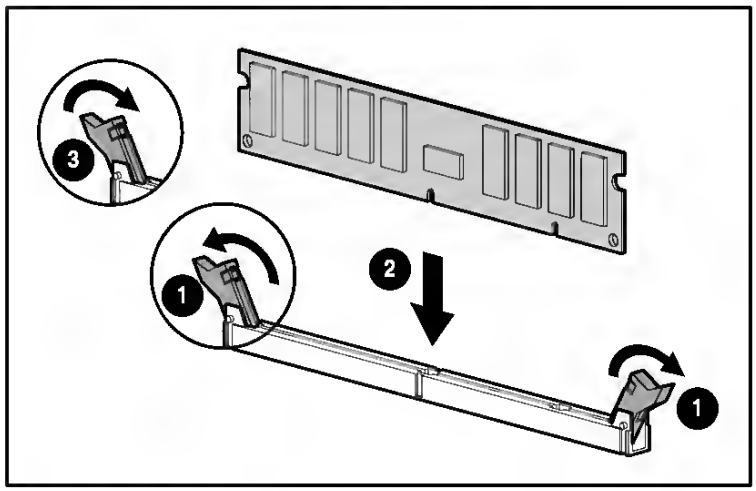

Figure 3-19. Installing a DIMM

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Removing a Memory Module

To remove a DIMM:

1. Follow the steps in "Removing the Access Panel" at the beginning of this chapter.
2. Press outward on both latches of the DIMM socket at the same time ❶. This releases the DIMM and pushes it partially out of the socket.
3. Lift the DIMM from the socket ❷.

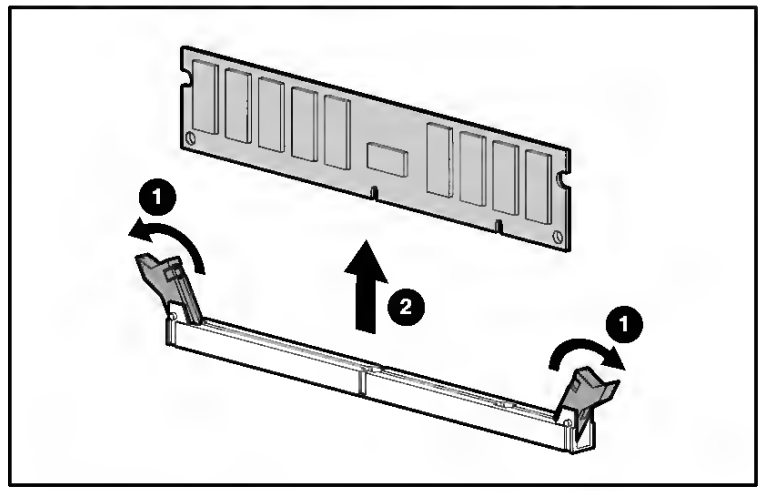

Figure 3-20. Removing a DIMM

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Processors and PPMs

The ProLiant ML330 Generation 2 server comes standard with an Intel Pentium III processor. Its corresponding PPM is integrated on the system board. An optional processor and PPM can be installed.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

CAUTION: To prevent damage to equipment or loss of information, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the access panel.

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Make sure that you are properly grounded (earthed) before beginning any installation procedure. See Appendix B, "Electrostatic Discharge," for more information.

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Installing a Processor

IMPORTANT: Both processors must be the same speed.

1. Verify that all critical data has been backed up.
2. Ensure that your server has the most current ROM version. To update your ROM, visit the Compaq website at

   http://www.compaq.com/support/files/server/us/

   CAUTION: Failure to flash your ROM before installing a new processor may cause system failure.
3. Follow the steps in "Removing the Access Panel" at the beginning of this chapter.
4. To gain access to the processor sockets, remove the internal fan baffle.
   a. If the fan baffle is secured to the server with a screw, then remove the screw ❶. If not, continue to the next step.
   b. Unseat the baffle and slide it out and away from the chassis ❷.

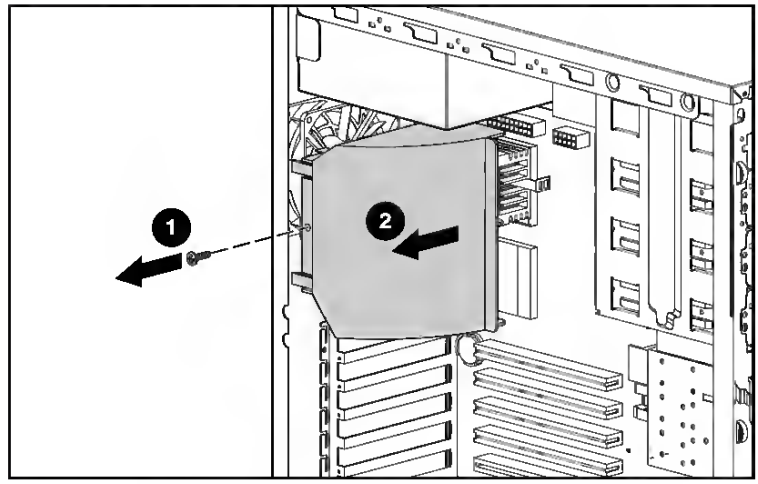

Figure 3-21. Removing the internal fan baffle

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5. Locate the processor sockets and PPM slot as shown in Figure 3-22 and Table 3-2.

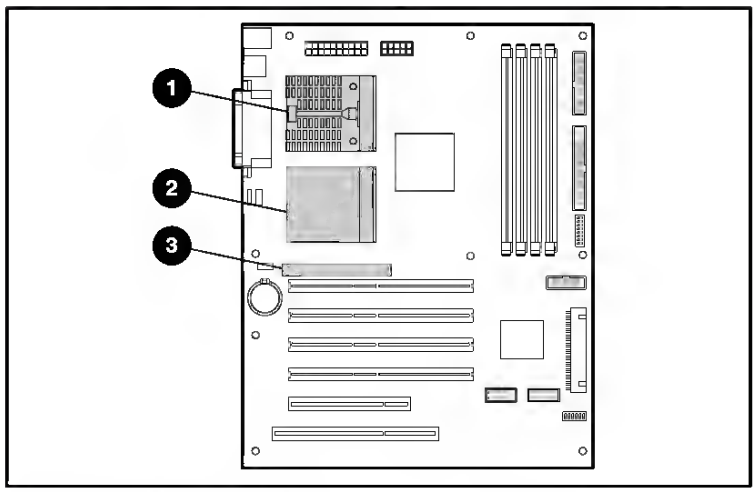

Figure 3-22. Locating the processor sockets and PPM slot

Table 3-2
Processor Sockets and PPM Slot

Item	Description
❶	Processor socket 1 (populated)
❷	Processor socket 2
❸	PPM 2 slot

Note: The PPM for Processor 1 is integrated on the system board.

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6. Raise the processor socket lever ❶, and then place the processor into the socket ❷, as shown in Figure 3-23. The guide posts and directional key marks on the socket must be aligned with the corresponding slots and marks on the processor.

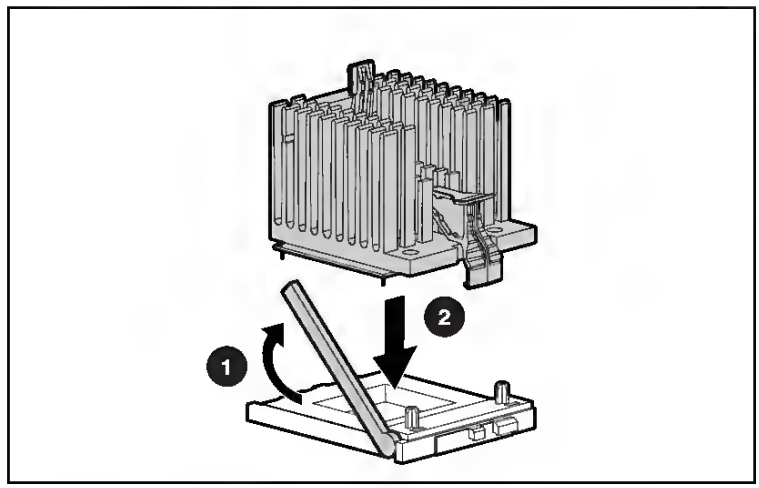

Figure 3-23. Installing a processor

7. Lower the processor socket lever, as shown in Figure 3-24.

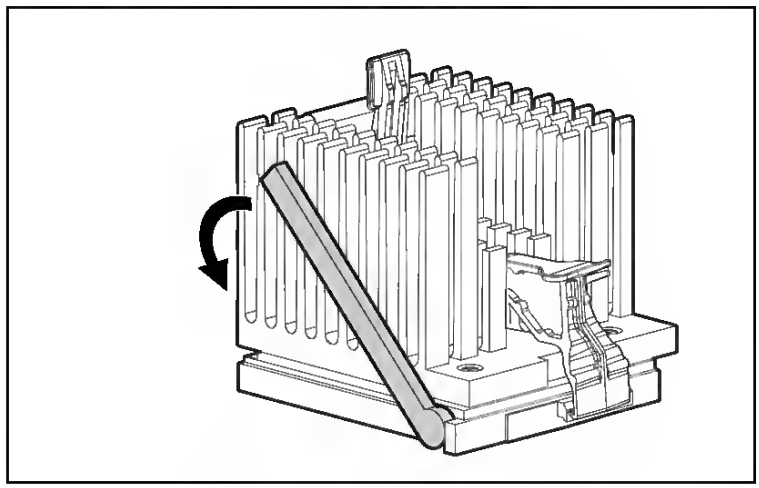

Figure 3-24. Lowering the processor socket lever

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8. Secure the heatsink retainer clip on the back of the processor to the socket, as shown in Figure 3-25.

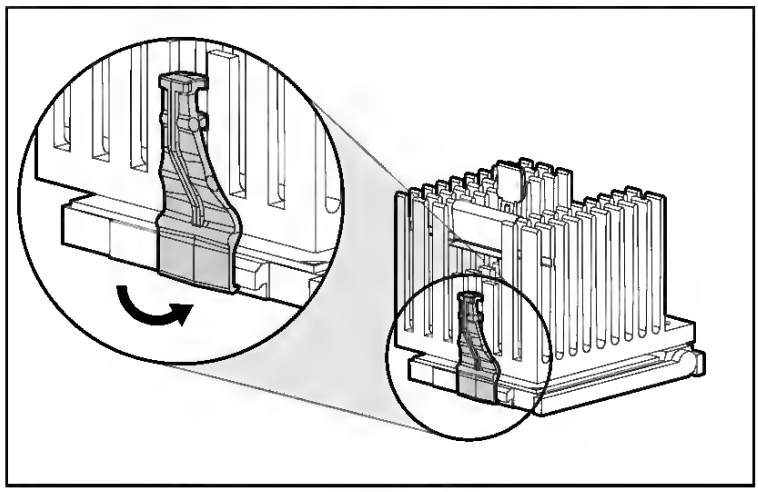

Figure 3-25. Securing the heatsink retainer clip

9. Secure the assembly clip on the front side of the processor to the socket ❶, and then lock the processor into place by pressing down on the assembly clip lever ❷.

CAUTION: Applying too much pressure on the assembly clip lever could cause it to break. Use care when performing this step.

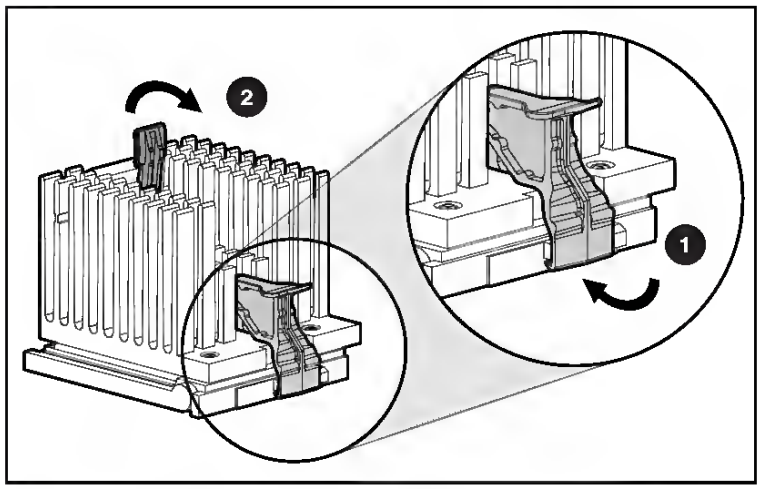

Figure 3-26. Securing the assembly clip

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10. Install the corresponding PPM before powering up the server. See the following section, "Installing the PPM for Processor 2."
11. Reinstall the internal fan baffle by reversing step 4.

Installing the PPM for Processor 2

Each Intel Pentium III processor supplied by Compaq comes with a PPM (DC-to-DC converter). The PPM must be installed into the slot adjacent to its processor to provide power to that processor.

NOTE: The PPM for Processor 1 is integrated on the system board.

1. Align the PPM with the PPM slot.
2. Slide the PPM into the slot ❶ until the latches snap securely into place ❷.

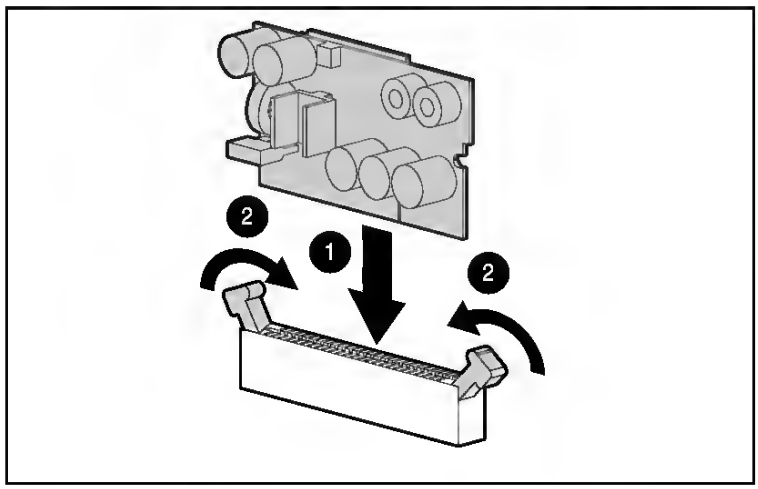

Figure 3-27. Installing a PPM

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Removing a Processor

1. Follow the steps in "Removing the Access Panel" at the beginning of the chapter.
2. Remove the internal fan baffle. See step 4 of "Installing a Processor" for instructions.
3. Locate the processors and PPM as shown in Figure 3-22 and Table 3-2.
4. Push up on the assembly clip lever to disengage the processor from the socket ❶, and then unhook each side of the processor from the socket.
5. Lift up the processor socket lever until it releases ❷.

IMPORTANT: The processor socket lever must be perpendicular to the system board to unlock the processor unit.

6. Remove the processor from the socket ❸.

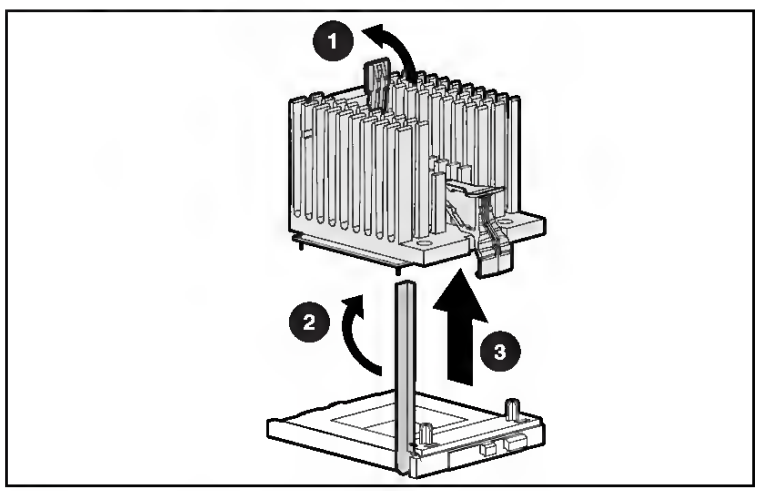

Figure 3-28. Removing the processor from the system board

7. Reinstall the internal fan baffle.
8. Reinstall the access panel.

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Removing the PPM for Processor 2

To remove the PPM, open the latches of the PPM slot ❶, and then remove the PPM from the slot ❷.

NOTE: The PPM for Processor 1 is integrated on the system board and cannot be removed.

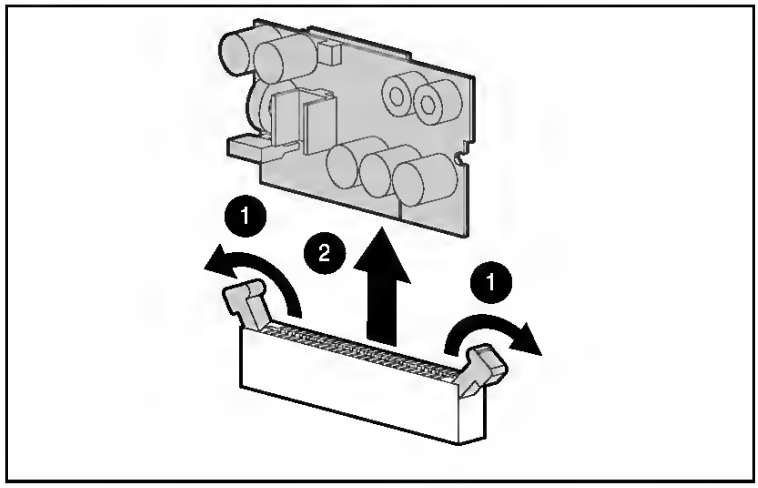

Figure 3-29. Removing the PPM

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Replacing Batteries

The ProLiant ML330 Generation 2 server has nonvolatile memory, which requires two batteries to retain system information. There is a battery on the system board and a battery on the Server Feature Board.

IMPORTANT: Refer to Appendix A, "Regulatory Compliance Notices," for battery disposal information.

WARNING: The system board contains a lithium battery. There is a risk of fire and chemical burn if the battery is handled improperly. Do not disassemble, crush, puncture, short external contacts, dispose of in water or fire, or expose the battery to temperatures higher than 60°C (140°F).

CAUTION: To prevent damage to equipment or loss of information, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the access panel.

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Make sure that you are properly grounded (earthed) before beginning any installation procedure. See Appendix B, "Electrostatic Discharge," for more information.

Replacing the System Board Battery

If your server no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock. When replacing a battery, use a CR2032 three-volt lithium coin cell battery.

After you have completed the battery installation, run RBSU (by pressing the **F9** key) to reconfigure your system. See Chapter 5, "Server Configuration and Utilities," or the *Compaq ROM Based Setup Utility User Guide*, for more information on RBSU.

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To replace the system board battery:

1. Follow the steps in "Removing the Access Panel" at the beginning of this chapter.
2. Locate the battery on the system board. See Figure 3-30 for the location of the battery.

NOTE: If you have expansion boards installed, it may be necessary to remove them to gain access to the battery. See "Installing an Expansion Board" earlier in this chapter for details.

3. Press outward on the latch at the top of the battery holder to release the battery ❶. Lift the battery away from the holder ❷.

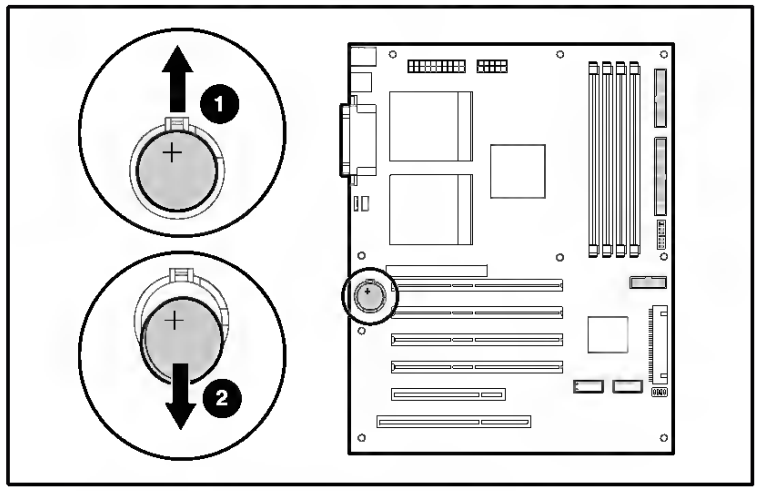

Figure 3-30. Removing the battery from the system board

4. Slide the replacement battery into the proper position with the positive (+) side up.

IMPORTANT: Positive polarity (+) should be positioned up.

5. Replace the server access panel and connect cables to the server.
6. Run RBSU to reconfigure your system by pressing the **F9** key when prompted during server startup. See Chapter 5, "Server Configuration and Utilities," or the *Compaq ROM Based Setup Utility User Guide*, for more information on RBSU.

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Replacing the Server Feature Board Battery

When replacing the battery on the Server Feature Board, use a CR2032 three-volt lithium coin cell battery. To replace the Server Feature Board battery:

1. Follow the steps in "Removing the Access Panel" at the beginning of the chapter.
2. Remove the Server Feature Board from expansion slot 6. See "Installing an Expansion Board" earlier in this chapter.
3. Release the battery by pressing outward on the battery holder latch, and then lift the battery away from the holder.
4. Slide the replacement battery into the proper position with the positive (+) side up.

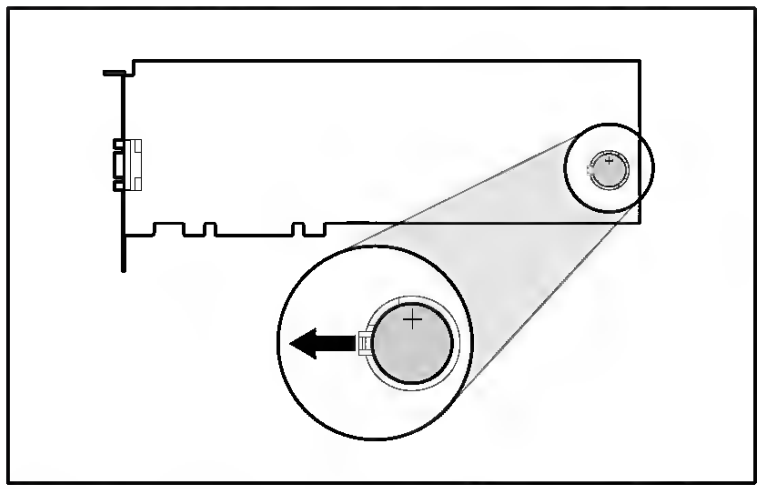

Figure 3-31. Replacing the Server Feature Board battery

5. Replace the Server Feature Board in expansion slot 6.

   See "Installing an Expansion Board" earlier in this chapter for detailed instructions.

6. Replace the access panel, and then connect cables to the server.
7. Run RBSU to reconfigure your system by pressing the **F9** key when prompted during server startup. See Chapter 5, "Server Configuration and Utilities," or the *Compaq ROM Based Setup Utility User Guide*, for more information on RBSU.

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Chapter 4

Cabling Guidelines

This chapter is an overview of the cabling that resides in the system chassis of a Compaq ProLiant ML330 Generation 2 server. Information on how to cable SCSI and ATA devices in the system, as well as information about all critical system cabling, is provided.

For detailed information on cable types supported by your server, refer to the *Compaq ProLiant ML330 Generation 2 Server Cabling Guide* found at the Compaq website:

http://www.compaq.com/products/servers/

CAUTION: To prevent damage to the equipment, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before installing devices.

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Make sure that you are properly grounded (earthed) before beginning any installation procedure. See Appendix B, "Electrostatic Discharge," for more information.

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SCSI Cabling

IMPORTANT: The cabling procedures in this section apply only to SCSI models of the ProLiant ML330 Generation 2 server or ATA models with a SCSI option card. See the following section, "ATA Cabling," for information on cabling ATA models.

IMPORTANT: ATA models with a SCSI option card require a SCSI cable not included with the option kit. Refer to the *Compaq ProLiant ML330 Generation 2 Cabling Guide* for cable information specific to your model.

Consider the following guidelines when adding SCSI devices to your ProLiant ML330 Generation 2 server:

- As a general rule, a maximum of seven devices may be added per channel. Your server is equipped with two integrated Wide Ultra3 SCSI channels.
- Be sure to remove all terminating jumpers from third-party SCSI devices.
- You must manually set the SCSI ID on each device to a unique value in the range of 0 through 6 for each SCSI bus. Refer to the documentation provided with the device for instructions on how to set the SCSI ID.

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Identifying SCSI Components

SCSI Cable Components

The SCSI cable shown in Figure 4-1 supports up to five SCSI devices and comes with a terminator on the end. One cable is included with SCSI models of the server.

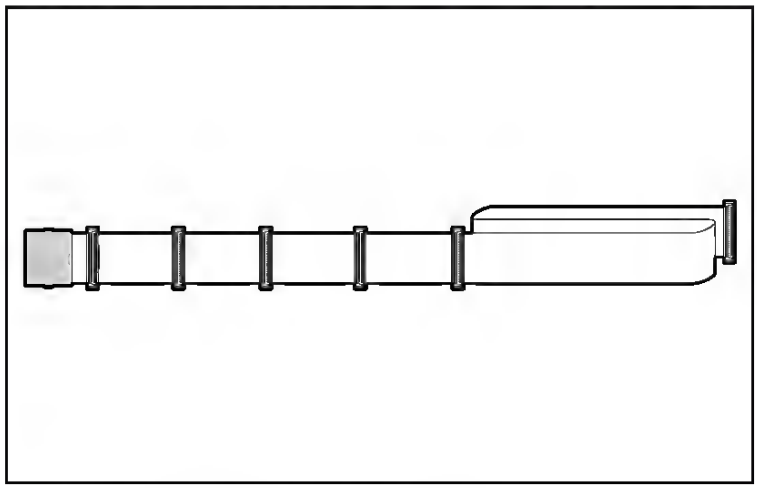

Figure 4-1. Identifying the SCSI cable with terminator

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Internal SCSI Components

Before cabling devices, note the removable media and hard drive compartment locations, shown in Figure 4-2 and Table 4-1. For information about installing optional SCSI devices, refer to Chapter 3, "Hardware Options Installation," or the documentation included with the device.

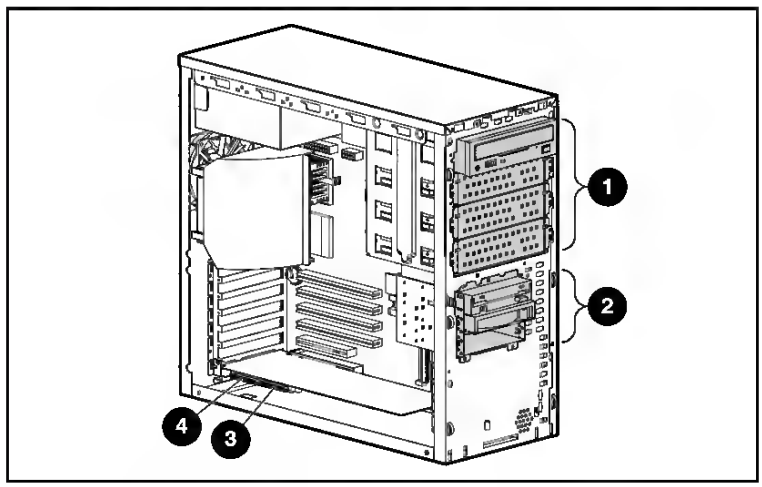

Figure 4-2. Internal SCSI components

Table 4-1
Internal SCSI Components

Item	Description
❶	Removable media bay area
❷	Hard drive bay area
❸	SCSI controller channel A (primary)
❹	SCSI controller channel B (secondary)

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68-to-50 pin SCSI Adapter

If installing a device that uses a Fast SCSI-2 interface, you must provide a 68-to-50 pin SCSI adapter (Part Number 199618-001), shown in Figure 4-3. This adapter should be installed between the 50-pin interface on the device and the 68-pin SCSI cable connected to the SCSI channel on the Server Feature Board.

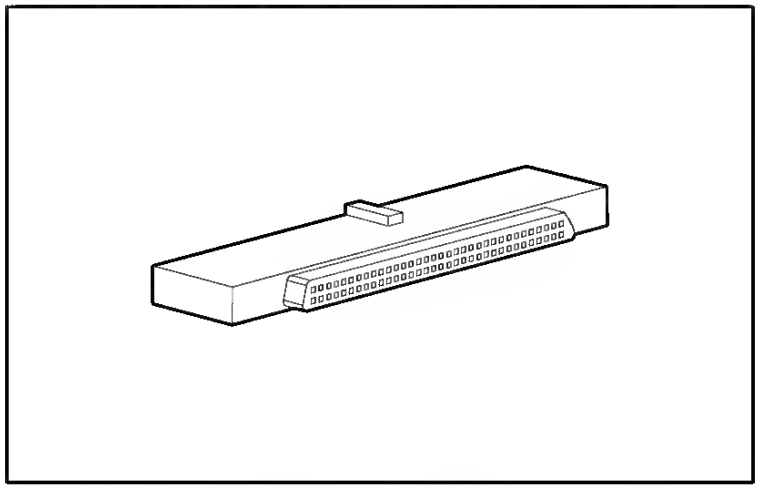

Figure 4-3. 68-to-50 pin (wide-to-narrow) SCSI adapter

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Cabling SCSI Devices

The following steps detail the procedure for connecting cables from an integrated Wide Ultra3 SCSI controller to an internal SCSI hard drive or other device:

1. Install the device. Refer to "Installing a Hard Drive" or "Installing a Device into a Removable Media Bay," in Chapter 3, "Hardware Options Installation," for instructions.
2. Make sure that the SCSI ID is uniquely set for each device.
3. Locate the cable connected to the primary channel on the Server Feature Board. If installing a tape drive, locate the cable connected to the secondary channel.

   NOTE: Compaq recommends connecting a tape drive to a separate SCSI cable to avoid a decrease in other SCSI device performance.

4. Install the next available connector on the cable to the hard drive or SCSI device.
5. Install the next available power connector to the hard drive or SCSI device.

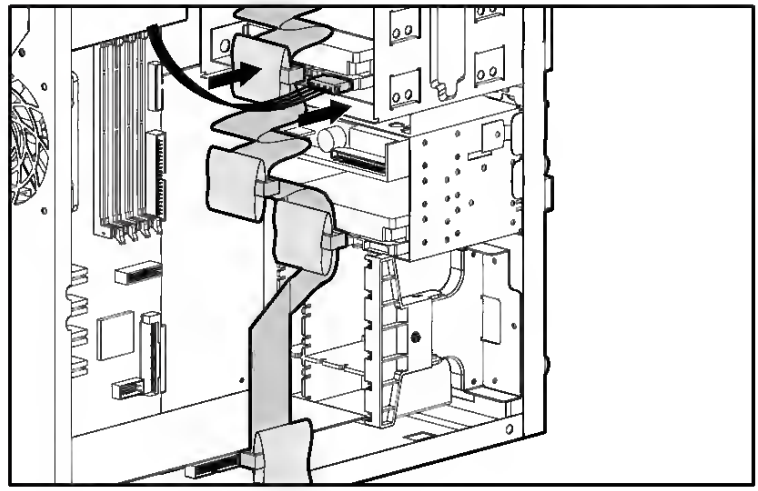

Figure 4-4. Cabling a SCSI hard drive or other device

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Cabling a Smart Array Controller

Many configurations are possible when multiple SCSI controllers are added. This section outlines the cabling procedure for an installed Smart Array Controller. Refer to the Smart Array Controller option documentation for further installation information.

The following steps outline the cabling procedure for the Smart Array Controller:

1. Install the Smart Array Controller as instructed in the option kit documentation.
2. If hard drives are not already installed, follow the appropriate steps in Chapter 3, "Hardware Options Installation," and then install the device.
3. Locate the cable connected to the SCSI channel on the Server Feature Board.
4. Remove the cable from the SCSI channel.

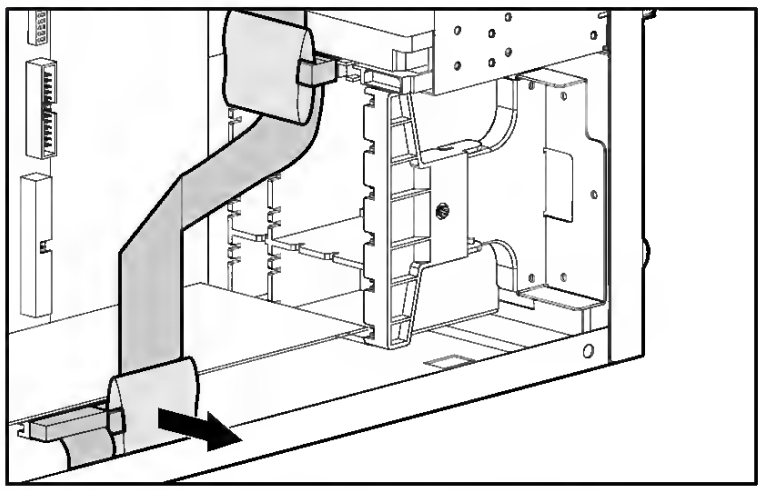

Figure 4-5. Removing the SCSI cable from the Server Feature Board

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5. Connect the SCSI cable to the Smart Array Controller.

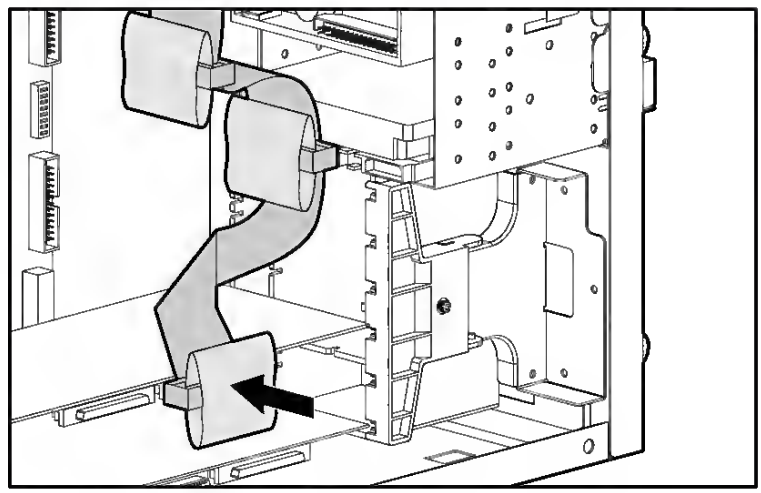

Figure 4-6. Connecting the SCSI cable to the Smart Array Controller

NOTE: The SCSI channels on the Server Feature Board are self-terminating. If you choose not to use a SCSI channel, you do not need to install a terminated cable.

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ATA Cabling

IMPORTANT: The cabling procedures in this section apply only to ATA models of the ProLiant ML330 Generation 2 server. See the previous section, "SCSI Cabling," for information on cabling SCSI models.

IMPORTANT: ATA models with a SCSI option card require a SCSI cable not included with the option kit. Refer to the *Compaq ProLiant ML330 Generation 2 Cabling Guide* for cable information specific to your model.

Consider the following guidelines when adding ATA devices to your ProLiant ML330 Generation 2 server:

- A maximum of two devices may be added per channel. Your server is equipped with two integrated ATA/100 channels.
- Jumpers on ATA devices should be set to Cable Select (CS), enabling primary and secondary devices to be determined by the cable. See Figure 4-7 for ATA cable information.

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Identifying ATA Components

ATA Cable Components

The ATA cable shown in Figure 4-7 supports up to two ATA devices. Two cables are included with ATA models of the server.

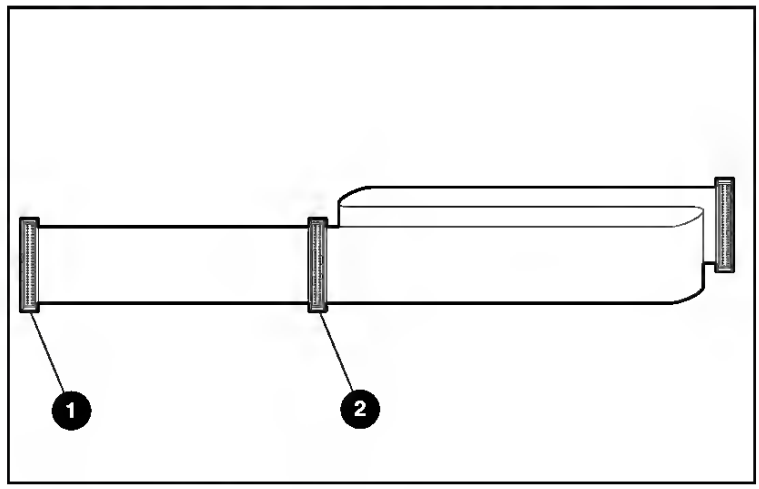

Figure 4-7. Identifying the ATA cable connectors

Table 4-2
ATA Cable Connectors

Item	Connector
❶	Device 0 (primary)
❷	Device 1 (secondary)

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Internal ATA Components

Before cabling devices, note the removable media and hard drive compartment locations, shown in Figure 4-8 and Table 4-3. For information about installing optional ATA devices, refer to Chapter 3, "Hardware Options Installation," or the documentation included with the device.

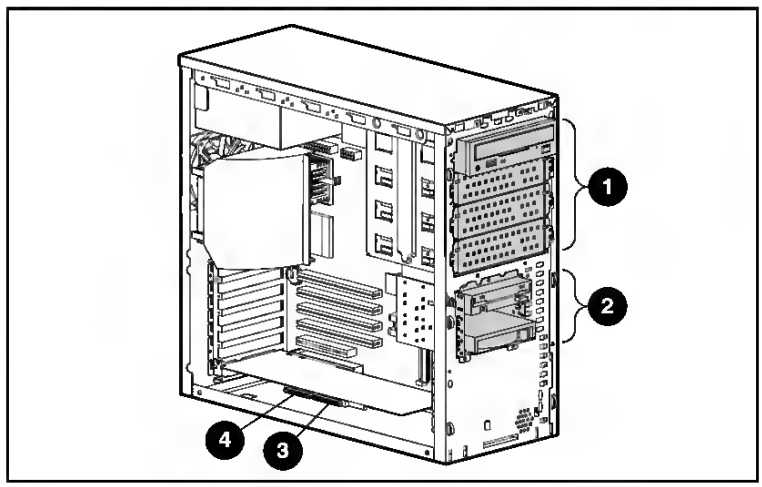

Figure 4-8. Internal ATA components

Table 4-3
Internal ATA Components

Item	Description
❶	Removable media bay area
❷	Hard drive bay area
❸	ATA controller channel B (secondary)
❹	ATA controller channel A (primary)

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Cabling ATA Devices

The following steps detail the procedure for connecting cables from an integrated ATA/100 controller to an internal ATA hard drive or other device:

1. Install the device. Refer to "Installing a Hard Drive" or "Installing a Device into a Removable Media Bay," in Chapter 3, "Hardware Options Installation," for instructions.
2. Make sure that the jumper on the drive is set to Cable Select (CS).
3. Install the next available cable connector to the hard drive or ATA device. Figure 4-9 and Table 4-4 show the cabling configuration when four ATA hard drives are installed. If fewer than four drives are installed, then follow these cabling steps accordingly.

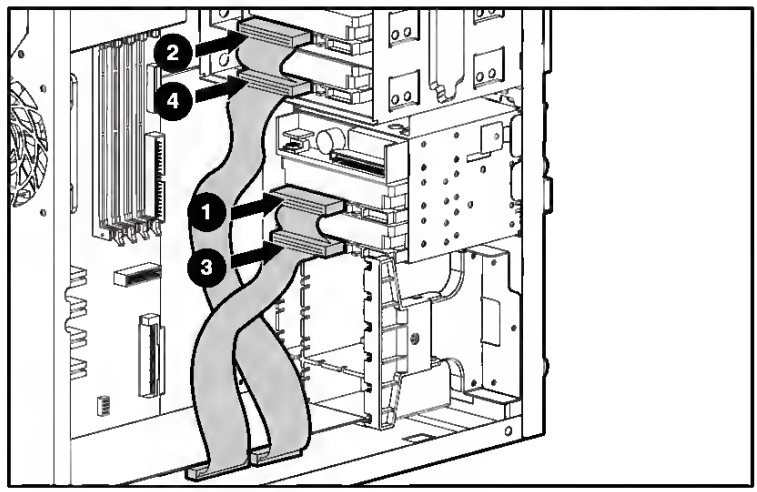

Figure 4-9. Cabling an ATA hard drive or other device

Table 4-4
ATA Cabling Sequence

Step	Channel/Cable	Cable Connector	Drive Location
❶	Primary	Device 0	Hard drive bay 2
❷	Secondary	Device 0	Media bay 3
❸	Primary	Device 1	Hard drive bay 3
❹	Secondary	Device 1	Media bay 4

Note: Refer to Chapter 1, "Server Features," for drive bay locations.

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4. Install the next available power connector to the hard drive or ATA device.

Cabling an ATAPI Tape Drive

The following steps detail the procedure for cabling an optional ATAPI tape drive:

1. Install the tape drive into removable media bay 2 by following steps 1 through 5 under "Installing a Tape Drive" in Chapter 3, "Hardware Options Installation."
2. Connect an ATA cable to the primary IDE channel on the system board ❶.

   See "System Board Components" in Chapter 1, "Server Features," for the location of the primary IDE channel.
3. Secure the cable connector labeled "Device 1" to the tape drive ❷ and the cable connector labeled "Device 0" to the CD-ROM drive ❸.

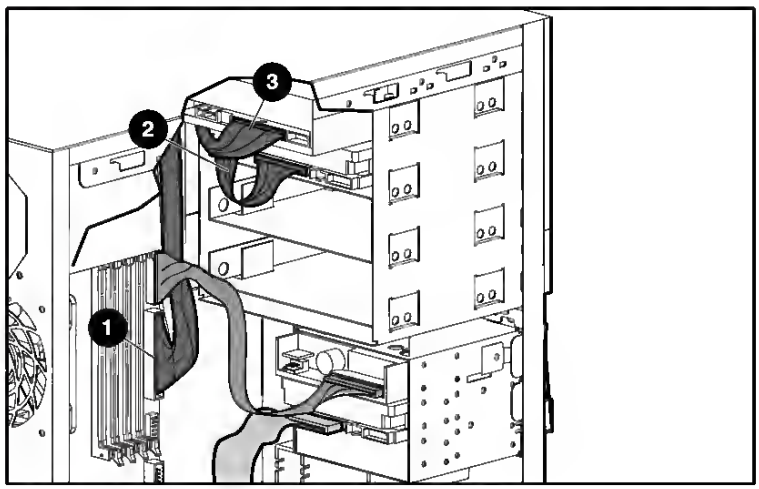

Figure 4-10. Cabling an ATAPI tape drive

4. Install the next available power connector to the tape drive.

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Chapter 5

Server Configuration and Utilities

This chapter provides information about the following utilities and support tools included with your Compaq ProLiant ML330 Generation 2 server:

- ROM Based Setup Utility (RBSU)
- Redundant ROM support
- ROMPaq
- SmartStart software
- SmartStart Diskette Builder
- Compaq Insight Manager
- Compaq Survey Utility
- Compaq Diagnostics utility
- Automatic Server Recovery-2 (ASR-2)
- Power-On Self-Test (POST)

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ROM Based Setup Utility

RBSU performs a wide range of configuration activities, including the following:

- Configuring system devices and installed options
- Viewing system information
- Selecting the operating system
- Selecting the primary boot controller

In addition, RBSU includes other features, which are outlined in "Using RBSU" later in this chapter.

For information on RBSU not found in this guide, refer to the *Compaq ROM Based Setup Utility User Guide* found in your documentation pack.

Navigating RBSU

To make selections within RBSU, use the following keys:

- To access RBSU, press the **F9** key during startup when prompted in the lower right corner of the screen.
- The arrow keys navigate through the menu system.
- Selections are made by pressing the **Enter** key.
- Selections are cancelled by pressing the **Escape** key.
- Selections and changes are saved by pressing the **F10** key.

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Using RBSU

NOTE: Most of the features in RBSU are not required in the setup of your server. The options in this utility are designed to assist with specific server configuration issues.

RBSU is separated into a series of menu selections designed to configure specific areas of the system. The primary menus are as follows:

- System Options
- IPL Boot Device
- PCI Devices
- Boot Controller Order
- Date and Time
- Automatic Server Recovery-2 (ASR-2)
- Server Passwords
- Server Asset Text
- Advanced Options
- Utility Language

System Options

The System Options menu configures the basic input/output (I/O) of the server and sets the operating system. The configuration options include the operating system, external ports, and controlling the diskette drive. The following is a list of selections found in this menu with an explanation of each option:

- **OS Selection** selects the primary operating system for the server. Default sever settings are automatically set based on the operating system selected.
- **Embedded COM Port *X*** sets the configuration for the internal serial port A or B. The configuration options include the address and interrupt request (IRQ). This option can also disable the port.
- **Embedded NIC Port 1 PXE Support** enables the Pre-boot Execution Environment (PXE) support for NIC Port 1. The **Embedded NIC Port PXE Support** option allows the server to boot to the network and attach to a PXE server with boot images. When enabled, the NIC port is displayed in the **Initial Program Loader** (IPL) list.

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- **Diskette Write Control** allows the user to configure the write control of the diskette drive. It can be set to read and write or to read only.
- **Diskette Boot Control** enables you to have the system boot from the removable media device.
- **Embedded LPT Port** allows the user to enable the embedded LPT Port at the specified resource settings or disable the option.

IPL Boot Device

The **IPL Boot Device** option configures the Initial Program Loader (IPL) device. It controls the search order the server goes through to look for a bootable device.

PCI Devices

The **PCI Devices** menu option displays and modifies the configuration of the PCI devices installed in the server. Information for eacb slot is displayed and the IRQs can be changed. Multiple PCI devices can share an interrupt.

Boot Controller Order

The **Boot Controller Order** menu option is used to view and assign the current controller order.

Date and Time

The **Date and Time** menu option is used to set the system date and time.

Automatic Server Recovery-2

The Automatic Server Recovery-2 menu configures the Automatic Server Recovery-2 (ASR-2) features and may include the following options:

- **ASR-2 Status** enables or disables ASR-2. When set to **Disabled**, no ASR-2 features function.
- **ASR-2 Timeout** sets a timeout limit for resetting a server that is not responding. When the server has not responded in the selected amount of time, it automatically resets.
- **Thermal Shutdown** enables or disables the ability of the server to automatically power down when it reaches a dangerous temperature.

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Server Passwords

The **Server Passwords** menu configures the password environment of the server. The available options are:

- **Set Admin Password** sets a password to control access to the administrative features of the server. When this password is set, the administrative features of the server cannot be accessed without the correct password being entered.
- **Set Power-On Password** sets a password to control access to the server during power up. When this password is set, the server cannot be powered up without the correct password being entered.
- **Network Server Mode** is a security feature that protects an unattended network server while allowing it to run after a power interruption. When set to **Disabled**, the server operates normally. When set to **Enabled**, the following actions occur:
  - The local keyboard does not function unless the power-on password is entered.
  - When there is not a diskette in the diskette drive, the power-on password is bypassed, allowing the server to start.
  - When there is a diskette in the diskette drive, the server does not start unless the power-on password is entered locally.

  NOTE: Network Server Mode cannot be enabled until a power-on password has been established through the **Set Power-On Password** menu.
- **Quicklock** enables or disables the Quicklock feature. When set to **Enabled**, the keyboard is locked by pressing the **Ctrl+Alt+L** keys. The keyboard remains locked until the password is typed in.

  NOTE: If the password is disabled at the power-on key prompt, the Quicklock password feature will remain active until the next time the system is turned on.

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Server Asset Text

The **Server Asset Text** menu customizes the system-specific text for the server, including the following:

- **Set Server Information Text** defines reference information for the server, such as **Server Name**, **Server Asset Tag**, **Server Primary OS**, and **Other Text**.
- **Set Administrator Information Text** defines reference information for the server administrator, such as **Admin Name Text**, **Admin Phone Number Text**, **Admin Pager Number Text**, and **Other Text**.
- **Set Service Contact Text** defines reference information for the service contact of the server, such as **Service Name Text**, **Service Phone Number Text**, **Service Pager Number Text**, and **Other Text**.
- **Serial Number** allows the user to change the chassis serial number.

Advanced Options

The **Advanced Options** menu is used to configure advanced options of the system. The following is a list of selections found in this menu with an explanation of each option:

- **MPS Table Mode** allows the user to change the advanced programmable interrupt controller (APIC) table setting. This selection should be automatically set by **OS Selection**, but it allows the user to override the automatic selection.

  NOTE: The latest operating systems from Microsoft, Novell, and SCO bypass the use of IRQs and use an APIC. The APIC has been designed to address the issues associated with limited IRQs, multiprocessor systems, and shared interrupts. If you are using the latest operating system, you can let the system automatically configure interrupts for all devices in the system.

- **POST Speed Up** allows the user to enable or disable the quick or slow start process. The slow start process performs a complete memory test.
- **F1 Prompt** configures the server to require the user to press the **F1** key to proceed during power up when an error is encountered during the power-up sequence.

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- **Redundant ROM** toggles the server ROM between the current ROM and the backup ROM.
- **Erase Non-Volatile Memory** resets the non-volatile memory of the server to an initial, factory state. When **Yes** is selected, the non-volatile memory is erased and set to an initial, factory state.
- **Set CPU Corrected** is used to indicate that a previously failed processor has been corrected.
- **Wake Support (PME)** allows the user to enable or disable **Wake Support (PME)**.
- **Secondary IDE Controller** allows the user to enable or disable the secondary IDE controller.
- **NMI Debug Button** allows the user to disable or enable the **NMI debug** button on the Server Feature Board.

Utility Language

The **Utility Language** option is used to set the language in which RBSU is displayed.

Redundant ROM Support

Compaq ProLiant ML330 Generation 2 servers enable you to upgrade or configure your ROM safely with redundant ROM support. The server has a 2-MB ROM that acts as two, separate 1-MB ROMs. In the standard implementation, one side of the ROM contains the current ROM program version, while the other side of the ROM contains the backup version.

Safety and Security Benefits

When you flash the system ROM, ROMPaq writes over the backup ROM and saves the current ROM as a backup, enabling you to switch easily to the existing ROM version if the new ROM becomes corrupted for any reason. This feature protects your previous ROM version, even if you experience a power failure while flashing the ROM.

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Access to Redundant ROM Settings

Use ROMPaq utilities to create a backup ROM image before upgrading the configuration or to restore saved ROM data.

1. Access RBSU by pressing the **F9** key when the prompt displays in the lower right corner of the screen during power up.
2. Select the **Redundant ROM** option in the **Advanced Options** menu of RBSU.
3. Select one of the ROM banks as the system ROM.
4. Press the **Enter** key.
5. Press the **Esc** key to exit the current menu or press the **F10** key to exit RBSU.
6. Restart the server.

When the server boots, the system identifies whether the current ROM bank is corrupt. If a corrupt ROM is detected, the system boots from the backup ROM and alerts you through POST that the ROM bank is corrupt.

Switching ROM images, in the event that RBSU is inaccessible, can also be done by changing the switch settings on the system configuration switch. See Appendix E, "LED Indicators, Switches and Jumpers," for instructions.

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Disaster Recovery

If both the current and backup versions of the ROM are corrupt:

1. Create a new ROMPaq diskette using your SmartStart for Servers CD. See "SmartStart Diskette Builder" later in this chapter for instructions.

IMPORTANT: If the ROM is corrupted by a ROMPaq interruption, the initial ROMPaq attempt may have affected the contents of the original diskette.

---

2. Power down the server.
3. Insert the ROMPaq diskette.
4. Power up the server.
5. The server generates one long beep and two short beeps to indicate that you are in disaster recovery mode. The keyboard, mouse, and monitor are inactive.
6. The server analyzes the diskette, searching for the latest ROM image. If the diskette is not in place, the system continues to beep until a valid ROMPaq diskette is inserted.
7. The ROMPaq diskette then flashes both system ROM images.
8. At the successful completion of this process, a sequence of ascending audible beeps is generated. If the flash is not successful, a sequence of descending audible beeps is generated.
9. After successful completion of this process, follow these steps:
   a. Power down the server.
   b. Remove the ROMPaq diskette.
   c. Power up the server as usual.

   If the ROMPaq upgrade procedure was unsuccessful, power down the server and repeat the above process.

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ROMPaq

Using flash ROM in Compaq servers allows the firmware (BIOS) to be upgraded with system or option ROMPaq utilities. To upgrade the BIOS, insert a ROMPaq diskette into the diskette drive, remove power from the system, and then power up the system again.

NOTE: See "SmartStart Diskette Builder" later in this chapter for instructions on creating a ROMPaq diskette.

The ROMPaq utility then checks the system and provides a choice (if more than one exists) of ROM revisions to which the system can be upgraded. This procedure is the same for both system and option ROMPaq utilities.

CAUTION: Do not power down during a firmware upgrade. A loss of power during upgrade may corrupt the firmware and prevent the system from starting.

SmartStart Software

The SmartStart for Servers CD is used to load the system software, thereby achieving a well-integrated server and ensuring maximum dependability and supportability. The SmartStart CD contains diagnostic utilities and ROMPaq tools.

To install the SmartStart CD, press the **F9** key to run RBSU and configure the primary operating system. Next, follow these steps:

1. Locate the SmartStart CD in the Server Setup and Management pack.
2. After you power up the server, press the CD-ROM drive eject button.
3. Insert the SmartStart CD into the CD-ROM drive with the labeled side up. Handle the CD by its edges, not by the flat surfaces of the disc.
4. When the busy indicator turns green, the SmartStart sequence begins.

   Refer to the SmartStart documentation included with your server to install the operating system, create updated driver diskettes, and run upgrade utilities.

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SmartStart Diskette Builder

The SmartStart CD contains a utility to generate support diskettes in the event that they are needed or the software cannot be used directly from the SmartStart CD. Support diskettes are "punched-out" from data stored on the SmartStart CD. The support includes:

- Array Configuration Utility (ACU)
- Operating System support
- Server utilities
- Erase utility
- System and Option ROMPaq diskettes

To run the Diskette Builder, use a workstation running Microsoft Windows 95, Windows 98, Windows NT, or Windows 2000. You also need several 1.44-MB diskettes. All data on the diskettes will be overwritten. Insert the SmartStart CD into the workstation drive. The CD automatically runs the Diskette Builder utility; however, if the system does not support the "auto-run" feature, use Windows Explorer to run *[CD-ROM DRIVE]*:\DSKBLDR\DSKBLDR.EXE.

Compaq Insight Manager

Compaq Insight Manager is the Compaq application for easily managing network devices. Compaq Insight Manager delivers intelligent monitoring and alerting as well as visual control of your Compaq devices, and includes the following functions:

- Forwards server alerts and fault conditions
- Monitors fault conditions and server performance
- Controls server security and configuration
- Remotely controls server
- Initiates rapid recovery services

Documentation for Compaq Insight Manager is available on the Compaq Management CD in *[CD-ROM DRIVE]*:\OVERVIEW.HLP.

IMPORTANT: You must install and use Compaq Insight Manager to benefit from the Compaq Pre-Failure Warranty on processors, hard drives, and memory modules.

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Compaq Survey Utility

Compaq Survey Utility is an online information-gathering agent for Microsoft Windows, Novell NetWare, and Linux that collects critical hardware and software information from various sources. If a significant change occurs between data-gathering intervals, the previous information is marked, and the data file is overwritten to reflect the latest configuration and changes. This file allows you to keep a historical record of change events for server hardware and software.

Compaq Survey Utility automatically runs at startup and on specified time intervals. You can modify the data-gathering interval by modifying the command-line parameters.

For more information on Compaq Survey Utility, including installation and application procedures, refer to the *Compaq Survey Utility Online Help User Guide* accessed through the Compaq website:

http://www.compaq.com/support/files/server/us/

Perform a search for "Survey Utility," and then follow the appropriate link.

Compaq Diagnostics Utility

The Compaq Diagnostics utility tests the operation of your Compaq hardware and isolates failed parts, whenever possible. Diagnostic error codes are generated when the Diagnostics utility recognizes a problem. These error codes help identify defective components. A Diagnostics diskette can be made by running the Compaq Server Diagnostics file available for download from the following website:

http://www.compaq.com/support/files/server/us/

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Automatic Server Recovery-2

ASR-2 is a feature of ProLiant servers that resets the system in the event of a catastrophic operating system error like a blue-screen, ABEND (abnormal end), or panic. A system failsafe timer, the ASR-2 timer, is started when the Compaq System Management driver, also known as the health driver, is loaded. The timer is reset periodically during normal operation, but in the event of operating system failure, the timer expires and restarts the server. ASR-2 increases server up time by restarting the server within a predetermined amount of time after the system stops responding. The Compaq Insight Manager console notifies you in the event of an ASR-2 restart. You can disable ASR-2 from the Compaq Insight Manager console.

Power-On Self-Test

POST is a series of diagnostic tests that checks firmware and assemblies to ensure that the system is functioning properly. This utility runs automatically every time the server is powered up.

See Appendix D, "Troubleshooting," for the normal power-up sequence and diagnosis of problems encountered during POST.

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Chapter 6

RAID Configuration and Management

This chapter provides an overview of the Integrated ATA RAID Configuration Utility that comes standard with ATA models of the Compaq ProLiant ML330 Generation 2 server.

Introduction to RAID

Overview of RAID

Redundant array of independent drives (RAID) is an array of multiple independent hard drives that can be accessed simultaneously, improving I/O (input/output) performance. The RAID array is recognized by the host computer as a single storage unit or as multiple logical units. Data loss, because of a drive failure, can be prevented by reconstructing missing data from the remaining data and parity drives.

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RAID Terminology

IMPORTANT: Only RAID levels 0, 1, and 0+1 are supported by the Integrated ATA RAID Configuration Utility.

RAID 0 (Stripe)

RAID 0 is a RAID level that involves breaking up data into smaller blocks and then writing a block to each drive in the array (striping). RAID 0 does not provide any data redundancy, but does offer the best performance of any RAID level.

RAID 1 (Mirror)

RAID 1 is a RAID level that involves duplicating all data from one drive to a second drive (mirroring). RAID 1 provides complete data redundancy, but at the cost of doubling the required data storage capacity. You must have a minimum of two hard drives to support RAID 1.

RAID 0+1

RAID 0+1 (also known as RAID 10) is a RAID level that provides both striping and mirroring capabilities. RAID 0+1 mirrors data from one drive to another and then stripes the data across a second set of drives. You must have a minimum of four hard drives to support RAID 0+1.

RAID 5

RAID 5 is not supported by the Integrated ATA RAID Configuration Utility. It is a RAID level that stripes data and parity information across drives and requires a minimum of three hard drives.

Spare

The spare option in the utility assigns an extra, unused drive as a spare to be used in case of a drive failure.

IMPORTANT: The spare option is applicable only in arrays with redundancy, such as RAID 1, RAID 0+1, and RAID 5. If a spare is not available, the failed drive must be replaced with a new drive so that the data on the failed drive can be rebuilt. The replacement drive capacity must be greater than or equal to the failed drive it replaces.

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Integrated ATA RAID Configuration Utility

The Integrated ATA RAID Configuration Utility is a standard feature of ATA models of the ProLiant ML330 Generation 2 server. The following sections detail the features of the utility, including how to access and change utility options.

Configuration Utility Features

The features of the Integrated ATA RAID Configuration Utility include:

- Optimized drive access
- RAID support before operating system loads
- Automatic detection and configuration
- Ability to handle configuration changes
- Support for PIO modes 0-4, MDMA modes 0-2, and Ultra DMA modes 0-5 (0-5 for ATA/100)
- Support for RAID levels 0, 1, and 0+1
- Multiple drive rebuilding
- Special handling of error log, spare drive, and rebuilding

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Using the Configuration Utility

After all hard drives have been installed and connected, press the **F8** key during startup to run the Integrated ATA RAID Configuration Utility and view the setup screen.

IMPORTANT: If you do not run the configuration utility setup (**F8**), the option ROM will automatically configure the drives to RAID 0.

The setup screen has three menu windows:

- Array Information
- Physical Drive Information
- Help Information

Array Information

IMPORTANT: You cannot add drives or remove drives from an array that has been already configured.

The **Array Information** window of the setup screen displays all the drive arrays configured. Use this section to create, delete, or edit the existing configurations. The drive arrays are displayed as a node in a tree, like Microsoft Windows Explorer. When opened, each node displays the properties of the array. Press the up arrow and down arrow keys to navigate the properties, and then press **Enter** to edit your selection.

Physical Drive Information

The **Physical Drive Information** window displays all the physical drives connected to the ATA channels and their properties. Press the up arrow and down arrow keys to navigate this section. This window is not editable.

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Help

The **Help** window displays hints on available options and provides a list of keys that you can use to perform tasks, such as:

- **Switch Windows (TAB)**—switches the control back and forth between the **Array Information** and the **Physical Drive Information** windows.
- **Auto Configure RAID 0 (F1)**—automatically creates and configures a striped array based on the available physical drives installed.
- **Auto Configure RAID 1 (F2)**—automatically creates and configures a mirrored array based on the available physical drives installed. You must have a minimum of two free hard drives in the array.
- **Auto Configure RAID 0+1 (F3)**—automatically creates and configures a RAID 0+1 array based on the available physical drives installed. You must have a minimum of four hard drives in the array.

IMPORTANT: All previous settings are lost when the Auto Configure option is run for striped, mirrored, and RAID 0+1 arrays.

- **Create Array (F4)**—creates a drive array. When this option is selected, a default array template is created. You must edit the array properties to complete the array creation. Use the arrow keys to highlight a property field, and then press the **Enter** key to edit that property. The array properties are as follows:
  - **Array Type**—selects the intended RAID mode including RAID 0, RAID 1, RAID 0+1, and Spare. The default for the Array Type option is RAID 0.
  - **Drive(s)**—selects the drives for the array. This option refers to the drive number listed in the Physical Drives Information box, not the number of drives in the array. Use the arrow keys, and then press the spacebar to select or deselect the drive or drives. Press the **Enter** key when done. There is no default for this setting.
  - **Stripe Size**—changes the stripe size. This field applies only to RAID 0 arrays. The default stripe size is 64 KB.

IMPORTANT: RAID configurations do not support a stripe size less than 32 KB.

IMPORTANT: You cannot change the stripe size of an array that has been already configured.

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- **Drive Size**—displays the size of the array and cannot be edited. If the array type is stripe, then the drive size is the total of all the drives selected. When mirror, drive size is shown by individual drive.
- **Build Array**—used to rebuild the array using a spare drive. When Build Array starts, it prompts the user to select the target drive, and then the rebuild starts. This option applies only to RAID 1 and RAID 0+1 arrays.

- **Delete Array (F5)**—allows you to delete a currently configured array.
- **Restore Old Configuration (F6)**—restores the configuration that was there before you entered the utility.
- **Edit Options (F7)**—edits the physical drive option status boxes located in the top right corner of the **Physical Drive Information** window. The options are as follows:
  - **WC-OFF**—enables or disables write cache

CAUTION: Enabling write cache may cause data loss or corruption during an unexpected loss of power.

  - **DMA-ON**—enables or disables DMA transfers

  Pressing the **F7** key will allow you to enable or disable these options. Press the **F7** key, move the cursor to the desired box, and then press the spacebar to check off the option. When enabled, the option status boxes will change from red to green.

- **Save and Exit (F10)**—saves the configuration and exits the utility.

  If you do not want to save the configuration or any changes that you have made, press the **Esc** key. Respond appropriately to the subsequent message boxes requiring confirmation.

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Troubleshooting

Drive Connection Tips

1. If you have two drives, connect one per channel. The performance of the array is best with one drive per channel.
2. Use the same type of drives or drives with similar capability (in terms of speed and capacity).
3. Do not use dissimilar drives on the same channel.
4. Always use 80-conductor Ultra ATA cables.
5. Ensure that proper jumper settings are used. Refer to Appendix E, "LED Indicators, Switches, and Jumpers," for information.
6. Do not connect any ATAPI devices (such as CD, ZIP, or LS120) to the ATA controller.

Configuration and Setup Tips

1. If you need to change array configuration, back up your data first. When an array configuration changes, previous data in that array is lost.
2. If you get an unexpected message, such as "Drives Missing" or "Configuration Mismatch," switch off the system and verify all connections, ATA cables, and power cables.
3. If you get a "Configuration Mismatch" message after adding new drives, that is because the new drives had been used before and the configuration on the drives was not cleared. If this message is displayed, press the **F8** key to go to the setup and create the array configuration as needed.

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Appendix A

Regulatory Compliance Notices

Regulatory Compliance Identification Numbers

For the purpose of regulatory compliance certifications and identification, your server is assigned a Compaq series number. The Compaq series number for the Compaq ProLiant ML330 Generation 2 server is Series ES1022. The series number can be found on the product label, along with the required approval markings and information. When requesting certification information for this product, always refer to this series number. This series number should not be confused with the marketing name or model number for your server.

Communications Commission Notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (personal computers, for example). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

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The rating label on the device shows which class (A or B) the equipment falls into. Class B devices have an FCC logo or FCC ID on the label. Class A devices do not have an FCC logo or FCC ID on the label. After the class of the device is determined, refer to the following corresponding statement.

Class A Equipment

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user is required to correct the interference at personal expense.

Class B Equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause barmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

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Declaration of Conformity for Products Marked with the FCC Logo—United States Only

This device complies with Part 15 of the FCC Rules and is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions regarding your product, contact:

Compaq Computer Corporation
P. O. Box 692000, Mail Stop 530113
Houston, Texas 77269-2000

or

1-800-652-6672 (1-800-OK-COMPAQ). For continuous quality improvement, calls may be recorded or monitored.

For questions regarding this FCC declaration, contact:

Compaq Computer Corporation
P. O. Box 692000, Mail Stop 510101
Houston, Texas 77269-2000

or

281-514-3333

To identify this product, refer to the Part, Series, or Model number found on the product.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Compaq Computer Corporation may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

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Mouse Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian Notice (Avis Canadien)

Class A Equipment

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Class B Equipment

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low-Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (in brackets are the equivalent international standards):

- EN55022 (CISPR 22)—Electromagnetic Interference
- EN55024 (IEC61000-4-2, 3, 4, 5, 6, 8, 11)—Electromagnetic Immunity
- EN61000-3-2 (IEC61000-3-2)—Power Line Harmonics
- EN61000-3-3 (IEC61000-3-3)—Power Line Flicker
- EN60950 (IEC950)—Product Safety

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Japanese Notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文をお読み下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
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VCCIマークが付いていない場合には、次の点にご注意下さい。

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Taiwanese Notice

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

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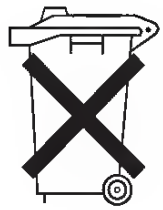
Battery Replacement Notice

Your server is provided with a lithium manganese dioxide battery. There is a danger of explosion and risk of personal injury if the battery is incorrectly replaced or mistreated. For more information about battery replacement or proper disposal, contact your Compaq authorized reseller or authorized service provider.

WARNING: Your server contains an internal lithium manganese dioxide battery. There is risk of fire and burns if the battery pack is not handled properly. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
- Do not expose to temperatures higher than 60°C.
- Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
- Replace only with the Compaq spare designated for this product.



Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. To forward them to recycling or proper disposal, use the public collection system or return them to Compaq, your Compaq authorized service resellers or authorized service providers, or their agents.

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Laser Compliance

The CD-ROM drive contains a laser diode of gallium aluminum arsenide (GaAlAs) emitting in the wavelength range of 780 ± 35 nm. All Compaq systems equipped with a laser device comply with safety standards, including International Electrotechnical Commission (IEC) 825. With specific regard to the laser, the equipment complies with laser product performance standards set by government agencies as a Class 1 laser product. The product does not emit hazardous laser radiation.

WARNING: Use of controls or adjustments or performance of procedures other than those specified herein or in the laser product's installation guide may result in hazardous radiation exposure. To reduce the risk of exposure to hazardous radiation:

- Do not try to open the unit enclosure. There are no user-serviceable components inside.
- Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.
- Allow only Compaq authorized service providers to repair the unit.

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States.

This marking on the internal CD-ROM drive indicates that the product is classified as a CLASS 1 LASER PRODUCT.

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Power Cords

If you were not provided with a power cord for your server, you should purchase a power cord that is approved for use in your country.

The power cord must be rated for the product and for the voltage and current marked on the electrical ratings label of the product. The voltage and current rating of the cord should be greater than the voltage and current rating marked on the product. In addition, the diameter of the wire must be a minimum of 1.00 mm^2 or 18AWG, and the length of the cord must be between 1.8 m (6 feet) and 3.6 m (12 feet). If you have questions about the type of power cord to use, contact your Compaq authorized service provider.

A power cord must be routed so that it is not likely to be walked on or pinched by items placed upon it or against it. Particular attention should be paid to the plug, electrical outlet, and the point where the cord exits from the product.

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Appendix B

Electrostatic Discharge

To prevent damaging the system, be aware of the precautions you must follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

Preventing Electrostatic Discharge

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

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Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ± 10 percent resistance in the ground cords. To provide proper grounding, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have a Compaq authorized reseller install the part.

NOTE: For more information on static electricity, or assistance with product installation, contact your Compaq authorized reseller.

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Appendix C

Server Error Messages

The following POST error message is new to the Compaq ProLiant ML330 Generation 2 server:

Table C-1
POST Error Message

Error Code	Audible Beeps	Probable Source of Problem	Action
A processor thermal event occurred prior to this power up, Processor *X*	None	Processor *X* (1 or 2) has reached an excessive temperature and has stopped operation	Verify the following information: ■ The heatsink is properly installed. ■ Server fans are properly installed and working. ■ Ambient temperature is within an acceptable range. See Appendix F, "Specifications," for operational temperature requirements.

For a complete listing of error messages, refer to the *Compaq Servers Troubleshooting Guide.*

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Appendix D

Troubleshooting

This appendix provides specific troubleshooting information for the Compaq ProLiant ML330 Generation 2 server. Use it to diagnose server startup and installation problems.

For information on LEDs, switch settings, and jumpers, see Appendix E, "LED Indicators, Switches, and Jumpers."

For information about general troubleshooting techniques, diagnostic tools, preventative maintenance, and a complete list of error messages, refer to the *Compaq Servers Troubleshooting Guide*, also included in your user documentation.

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This appendix includes the following topics:

- When the Server Does Not Start

  You are provided with step-by-step instructions on what to try and where to go for help with the most common problems encountered during initial Power-On Self-Test (POST). A successful startup requires the server to complete this test each time you power up, before the server can load the operating system and start running software applications.

- Problems After Initial Startup

  After your server has passed POST, you may still encounter errors, such as an inability to load your operating system. You are provided with instructions on what to try and where to go for help when you encounter errors after the server completes POST.

- Other Information Resources

  This section provides a list of reference information available for your server.

For troubleshooting information beyond the scope of this guide, both general and specific to the ProLiant ML330 Generation 2 server see "Other Information Resources" later in this appendix.

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When the Server Does Not Start

This section provides step-by-step instructions, for the ProLiant ML330 Generation 2 server, on what to try and where to go for help with the most common problems encountered during the initial Power-On Self-Test (POST). Every time your server boots, it must complete POST before it can load the operating system and start running software applications.

If the server completes POST and attempts to load the operating system, go to "Problems After Initial Startup" later in this appendix.

WARNING: There is a risk of personal injury from hazardous energy levels. The installation of options and the routine maintenance and service of this product must be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with equipment containing hazardous energy circuits.

Complete the following sequence of steps when the server does not start:

1. Verify that the server and monitor are plugged into a working outlet.
2. Make sure that your power source is working properly:
   - Check status using the Power On/Standby LED.

     See "System LEDs" in Appendix E, "LED Indicators, Switches, and Jumpers," for the location and status of the Power On/Standby LED.
   - Verify that the Power On/Standby switch was pressed firmly.

     Refer to the "Power Source" section in the *Compaq Servers Troubleshooting Guide* for details on what else to check.
3. If the system does not complete POST, or it does complete POST but does not load the operating system, refer to the "General Loose Connections" section in the *Compaq Servers Troubleshooting Guide*.

NOTE: If the server is rebooting repeatedly, verify that the system is not restarting due to an Automatic Server Recovery-2 (ASR-2) powerup caused by another problem. Check Compaq Insight Manager for notification of this event. Refer to the *Compaq Servers Troubleshooting Guide* for more information.

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4. Restart the server.
5. Check for the following "normal power-up sequence" to verify that your system meets the minimal hardware requirements and is powered up under normal operation:
   a. The front panel Power On/Standby LED turns green.
   b. The fans start up.
   c. The monitor displays messages regarding server initialization in the following sequence:

      Video initialization—The Compaq initialization screen is displayed.

      Processor initialization

      Memory test

      Memory initialization

      Diskette drive

      SCSI devices (if applicable)

      ATA devices (if applicable)

      Option ROM

   d. The operating system loads to complete the boot process.

If the problem persists, continue with the following section, "Diagnosis Steps."

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Diagnosis Steps

If your server does not power up, or powers up but does not complete POST, answer the questions in Table D-1 to determine appropriate actions based on the symptoms observed. According to the answers you give, you will be directed to the appropriate table in the section that immediately follows. That table outlines possible reasons for the problem, options available to assist in diagnosis, possible solutions, and references to other sources of information.

Table D-1
Diagnosis Steps

Question	The Next Step
Question 1: Is the front panel Power-On/Standby LED on? (either solid green or flashing)	If no, go to Table D-2, and then continue to Question 2 if the problem is not solved. If yes, continue to Question 3.
Question 2: Are any system board LEDs showing a failure or error condition? See Appendix E, "LED Indicators, Switches, and Jumpers," for the location and status information of all system board LEDs.	If no, go to Question 3. If yes, then: 1. Reseat the applicable component, and then restart the server. 2. If reseating does not fix the problem, replace the component with a known working component, and then restart the server. 3. Contact your Compaq authorized service technician if steps 1 and 2 do not fix the problem.
Question 3: Can you see anything on your monitor?	If no, go to Table D-3. If yes, video is available for diagnosis. Determine next action by observing POST progress and error messages. Refer to the *Compaq Servers Troubleshooting Guide* for a complete description of each POST error message.
Note: If your server attempts to load the operating system, go to "Problems After Initial Startup" later in this appendix.	

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Table D-2
Front Panel Power-On/Standby LED Is Not On

WARNING: To reduce the risk of electric shock or damage to the equipment, before opening access panels to reseat components, power down the server, and then disconnect the power cord.

Note: For LED locations and functions, see Appendix E, "LED Indicators, Switches, and Jumpers."

Possible Reasons	The Next Step
There is no AC power connection. The power button was not firmly pressed. The power button connector cable is not properly connected to the system board. A processor has failed or is not properly seated. The power supply has failed or is not connected.	1. Check the power cables. Make sure that they are fully connected. 2. Press the power button. 3. Check the power source. Refer to "Power Problems" in the *Compaq Servers Troubleshooting Guide* for further options. 4. Reconnect the power button cable to the system board. See Chapter 1, "Server Features," for the location of the power button connector. 5. Power down the server. Reseat all expansion boards, DIMMs, processors, and PPMs, verifying that all cables are securely connected. See Chapter 3, "Hardware Options Installation," for complete instructions. Refer to "General Hardware Problems" in the *Compaq Servers Troubleshooting Guide* for tips on proper procedures. 6. Check the diagnostic LEDs on the system board for failure conditions. 7. If these steps do not correct the problem, the most likely cause lies either in the power supply subsystem or a processor. Contact your Compaq authorized service provider for further technical support. Refer to the *Compaq Servers Troubleshooting Guide* for a list of Compaq authorized service providers.

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Table D-3
Server Does Not Have Video

WARNING: To reduce the risk of electric shock or damage to the equipment, before opening access panels to reseat components, power down the server, and then disconnect the power cord.

Note: For LED locations and functions, as well as switch setting information, see Appendix E, "LED Indicators, Switches, and Jumpers."

Possible Reasons	The Next Step
Video may not be properly connected. Switches may not be correctly set on the system board. If an optional video card was installed, the monitor cable may not be correctly connected. The monitor may be connected to the wrong video connector. Expansion boards or DIMMs may not be properly connected or seated.	1. Verify that the monitor has power and that the monitor cable is securely connected. If more than one video adapter is installed, make sure that the monitor is connected to the correct video card. 2. Verify that the monitor is functional by connecting it to a known working server. 3. Verify that the switch settings on the system board are correctly set. 4. Power down the server. Reseat all expansion boards and DIMMs, and then verify all cable connections. See Chapter 3, "Hardware Options Installation," for bezel and side panel removal. 5. Restart the server. 6. Listen for audible indicators, such as a series of beeps. A series of beeps indicates the presence of a POST error message. Refer to the *Compaq Servers Troubleshooting Guide* for a complete listing of possible POST error messages. 7. Check the diagnostic LEDs on the system board for failure conditions. 8. Refer to "Video Problems" in the *Compaq Servers Troubleshooting Guide*. If these steps do not correct the problem, contact your Compaq authorized service provider for further technical support.

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Problems After Initial Startup

After your server has passed POST, you may still encounter errors, such as an inability to load your operating system. Use Table D-4 to troubleshoot server installation problems that occur after the initial startup.

For updated information on supported operating systems, refer to Appendix F, "Specifications," or visit the Compaq website at

http://www.compaq.com/products/servers/platforms/

NOTE: If the server is rebooting repeatedly, verify that the system is not restarting due to an Automatic Server Recovery-2 (ASR-2) powerup caused by another problem. Check Compaq Insight Manager for notification of this event. Refer to the *Compaq Servers Troubleshooting Guide* for more information.

Refer to the *Compaq Servers Troubleshooting Guide* for the following:

- Information you must collect when diagnosing software problems and to provide when contacting support.
- Instructions on how to upgrade your operating system and its drivers.
- Information on available recovery options and advice on minimizing downtime.

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Table D-4
Problems After Initial Startup

Problem	Possible Cause	Possible Solution
The system cannot load SmartStart.	Wrong version of SmartStart is being installed.	1. Check the SmartStart release notes and user documentation. 2. Refer to the Compaq website to verify the version of SmartStart.
	The CD-ROM/diskette drive assembly is not set as a bootable device.	1. Press the **F9** key to run the ROM Based Setup Utility (RBSU). 2. Set defaults and exit the utility. 3. Rerun RBSU to verify the system configuration. Refer to Chapter 5, "Server Configuration and Utilities," or the *Compaq ROM Based Setup Utility User Guide*, for complete instructions on the use of RBSU.
	The CD-ROM/diskette drive assembly is either not installed, or is not properly connected.	1. Power down the server. 2. Verify that the CD-ROM/diskette drive assembly is installed. 3. Remove and reseat the CD-ROM/diskette drive assembly. 4. Check the cable between the backplane and the CD-ROM/diskette drive assembly to ensure proper connection. Refer to the *Compaq ProLiant ML330 Generation 2 Server Maintenance and Service Guide* for connection information. If the cable is not the problem, refer to "CD-ROM Problems" in the *Compaq Servers Troubleshooting Guide*.
	The diskette in CD-ROM/diskette drive assembly is preventing the system from loading.	Remove the diskette.

continued

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Table D-4
Problems After Initial Startup *continued*

Problem	Possible Cause	Possible Solution
SmartStart fails during installation.	An operating system has not been selected.	1. Press the **F9** key to run RBSU. 2. Select the primary operating system.
	Error occurs during installation.	Follow the error information provided. If it is necessary to reinstall, first run the Compaq System Erase Utility. Refer to the *Compaq Servers Troubleshooting Guide*.
	CAUTION: The Compaq System Erase Utility causes the loss of all configuration information, as well as loss of existing data on all connected hard drives. Read "Compaq System Erase Utility" and the associated cautionary statements in the *Compaq Servers Troubleshooting Guide* before performing this operation.	
Server cannot load operating system.	Required operating system step was missed.	Follow these steps: 1. Note at which phase the operating system failed. 2. Remove any loaded operating system components. 3. Refer to your operating system documentation. 4. Reinitiate installation procedures.
	Installation problem occurred.	Refer to your operating system documentation and to the SmartStart release notes.
	Primary hard drive controller installation is incorrect.	Run RBSU by pressing the **F9** key and correct this problem.
	Hard drive controller order is incorrect.	Run RBSU by pressing the **F9** key and correct this problem.
	Encountered problem after new hardware was added to the system.	Refer to the documentation provided with the hardware. Remove the new hardware.
	Problem was encountered with hardware added to a system with a factory-installed operating system.	You must complete the factory-installed operating system software installation BEFORE adding new hardware to the system. Be sure that you are following the instructions provided in the *Compaq Factory-Installed Operating System Software Installation Guide*. Remove the new hardware and complete the software installation. Then, reinstall the new hardware.
Note: Refer to Chapter 5, "Server Configuration and Utilities," or the *Compaq ROM Based Setup Utility User Guide*, for complete instructions on the use of RBSU.		

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Other Information Resources

Refer to the following information in Table D-5 for additional help.

Table D-5
ProLiant ML330 Generation 2 Server Troubleshooting Resources

Resource	What it is
Compaq Servers Troubleshooting Guide	This is a resource for obtaining troubleshooting information that is beyond the scope of this document. It includes general hardware and software troubleshooting information for all Compaq ProLiant servers, a complete list of error messages along with an explanation of probable cause, and a list of appropriate measures. This guide ships with your server.
Compaq ProLiant ML330 Generation 2 Server Maintenance and Service Guide	This resource provides a complete list of all replacement parts available, along with step-by-step instructions on installation and replacement. Find this guide on the Compaq website at http://www.compaq.com/support Follow the link for maintenance and service guides, and download the guide provided for your server.

You can access information on warranties and service and support upgrades (*CarePaq*™ services) by visiting the Compaq website at

http://www.compaq.com/services/carepaq

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Appendix E

LED Indicators, Switches, and Jumpers

This appendix provides information on LED statuses, switch settings, and jumper settings for Compaq ProLiant ML330 Generation 2 servers.

This appendix includes the following topics:

- LEDs

  There are several LEDs located on the front, the back, and the inside of your server. These LEDs communicate the status of your server components and operations, thus aiding you in diagnosing the problem. You are provided with an illustration of the location of each LED on your server, as well as an explanation of uses and possible statuses in the following section.

- Switches

  There are two switchbanks in your server. Some switch settings may need to be changed from time to time and can cause problems if they are not correctly set. Some switches should not be changed for any reason. You are provided with a description of what each setting means, and an illustration of where the switches are found inside your server.

- Jumpers

  When devices are added to the server, the jumpers on the device may need to be changed. You are provided with information on jumper settings for both SCSI and ATA devices.

For information beyond the scope of this guide, both general and specific to the ProLiant ML330 Generation 2 server, see "Other Information Resources" in Appendix D, "Troubleshooting."

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LEDs

A variety of LEDs is located on the front and back of your server. These LEDs aid you in diagnosing problems by communicating the status of the components and operations of the server. The following ProLiant ML330 Generation 2 server LEDs are explained in this appendix.

- System LEDs (on the front of the server)
- System board LEDs
- Network controller LEDs (on the back of the server)

System LEDs

The system LEDs and the power button are located on the front of the server, and are visible when the bezel door is open

The system LEDs show:

- Power On/Standby status
- Hard drive activity

The power button allows you to:

- Power up the server (provide AC power)
- Place the server in standby mode
- Power down the server

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See Figure E-1 and Table E-1 for an explanation of each possible LED status.

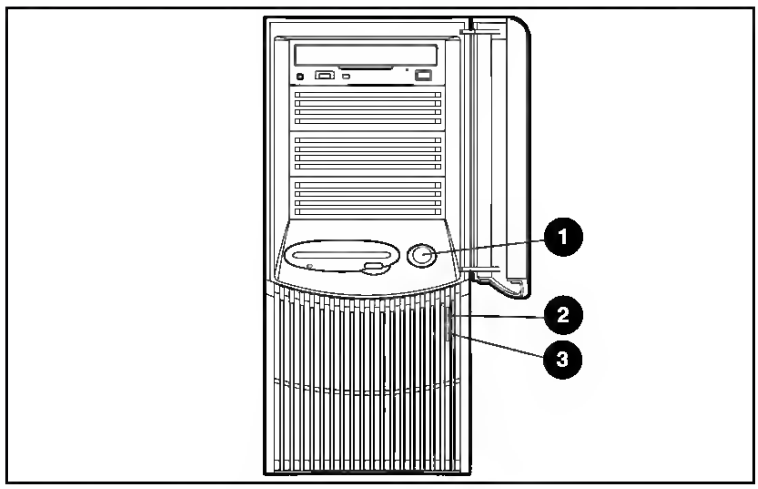

Figure E-1. Power button and system LEDs

Table E-1
Power Button and System LEDs

Item	Description	Status	Means
❶	Power button	N/A	N/A
❷	Power On/Standby LED	Green	System on, AC power OK. Do not remove power from system.
		Flashing	System in standby mode. AC power OK. Do not remove power from system.
		Off	System off, no AC power.
❸	Hard drive LED	On or flashing	A hard drive is being accessed.
		Off	No hard drive is currently being accessed.

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System Board LEDs

The following LEDs are located on the system board of the ProLiant ML330 Generation 2 server and indicate error conditions, such as processor, PPM, or memory module failures. Table E-2 provides detailed information for all system board LEDs

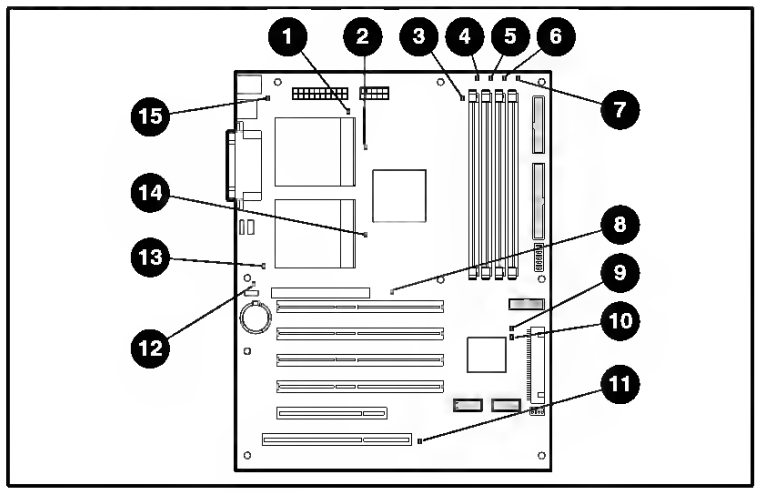

Figure E-2. System Board LEDs

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Table E-2
System Board LEDs

Item	Description	Status	Means
❶	AC power	Off	The AC power cord is not plugged into the power supply or the power supply failed
		Green	Power supply is on and functioning
❷	Processor 1 thermal	Off	Processor 1 temperature normal
		Amber	Thermal trip for processor 1 detected. See Appendix C, "Server Error Messages," for appropriate instructions.
❸	PPM 1 (integrated) failure	Off	PPM 1 functioning
		Amber	PPM 1 failed
❹	DIMM 1 failure	Off	DIMM 1 functioning
		Amber	DIMM 1 failed
❺	DIMM 2 failure	Off	DIMM 2 functioning
		Amber	DIMM 2 failed
❻	DIMM 3 failure	Off	DIMM 3 functioning
		Amber	DIMM 3 failed
❼	DIMM 4 failure	Off	DIMM 4 functioning
		Amber	DIMM 4 failed
❽	PPM 2 failure	Off	PPM 2 functioning
		Amber	PPM failed or missing (if the corresponding processor is installed)
❾	Health	Off	Normal (system in standby mode)
		Green	Normal (system powered on)
		Amber	System degraded
		Red	System critical

continued

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Table E-2
System Board LEDs *continued*

Item	Description	Status	Means
⑩	Temperature threshold	Off	Temperature is normal
		Amber	Temperature threshold exceeded
⑪	Server Feature Board installation failure	Off	Server Feature Board is installed properly
		Amber	Server Feature Board is not installed properly
⑫	System fan failure	Off	Fan is functioning
		Amber	Fan is not installed or has failed
⑬	Processor failure 2	Off	Processor 2 functioning
		Amber	Processor 2 failed
⑭	Processor 2 thermal	Off	Processor 2 temperature normal
		Amber	Thermal trip for processor 2 detected. See Appendix C, "Server Error Messages," for appropriate instructions.
⑮	Processor failure 1	Off	Processor 1 functioning
		Amber	Processor 1 failed or is missing

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Network Controller LEDs

The network controller LEDs are located on the back of the server. They provide the following information:

- If the server is linked to the network
- The speed at which the network is being accessed
- If there is current network activity

Refer to the *Compaq Servers Troubleshooting Guide* for more information on troubleshooting network controller problems.

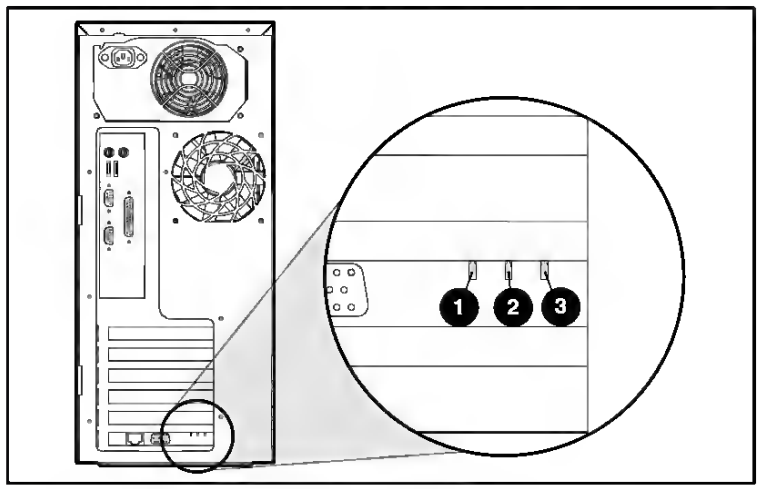

Figure E-3. Network controller LEDs

Table E-3
Network Controller LEDs

Item	Description	Status	Means
❶	Network speed LED	Off	10Base-T 10-Mbps (10Base-T Ethernet)
		On	100Base-T 100-Mbps (100Base-T Ethernet)
❷	Network link LED	Off	No network link
		On	Linked to network
❸	Network activity LED	Off	No network activity
		On or flashing	Network activity

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Switch Settings

The ProLiant ML330 Generation 2 server contains two switchbanks. This section explains the use of each reserved and nonreserved switch

System Configuration Switch Settings

The system configuration switchbank is located on the system board. Some switches are reserved for use by Compaq authorized service providers and must not be changed unless instructed otherwise.

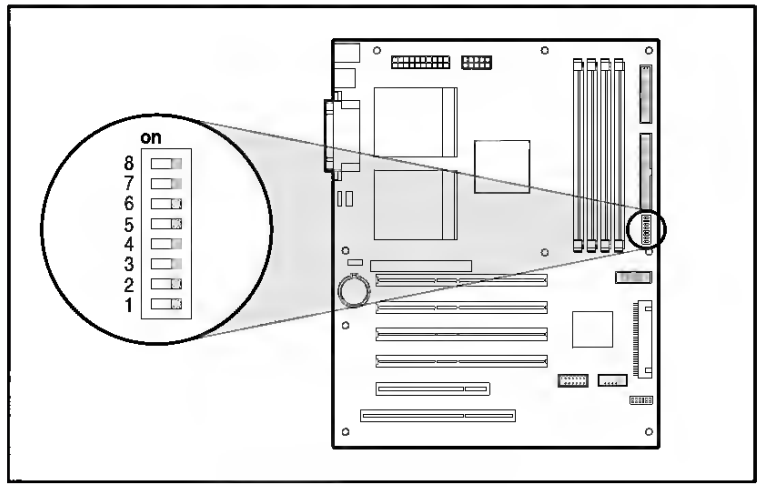

Figure E-4. System configuration switch default settings

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Table E-4
System Configuration Switch Settings

CAUTION: Clearing nonvolatile RAM (NVRAM) deletes your system configuration. Refer to Chapter 5, "Server Configuration and Utilities," for instructions on configuring your server.

Position	Default	Description	Settings
1	Off	Embedded video	Off = Embedded video enabled On = Embedded video disabled
2	Off	Lock configuration	Off = Normal operation On = Configuration changes cannot be made
3	Off	Tower/rack configuration	Off = Tower configuration On = Rack configuration
4	Off	Diskette boot	Off = Enable diskette boot On = Disable diskette boot
5	Off	Password disable	Off = Normal On = Disable password prompts
6	Off	Clear CMOS and NVRAM	Off = Normal On = When the server is powered up, all system configuration information is erased
7	Off	Reserved	N/A
8	Off	Reserved	N/A

Note: Switch positions 7 and 8 are reserved for Compaq authorized service providers only. Do not change the specified default setting for these positions, unless instructed otherwise.

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Resetting System Configuration Settings

It may be necessary at some time to clear and reset system configuration settings. When the system configuration switch position 6 is set to the **on** position, the system is prepared to erase all system configuration settings from both CMOS and NVRAM:

CAUTION: Clearing nonvolatile RAM (NVRAM) deletes your system configuration. Refer to Chapter 5, "Server Configuration and Utilities," for instructions on configuring your server.

1. Power down the server.
2. Set the system configuration switch position 2 to the **on** position.
3. Power up the server.

   All configuration settings are now erased and all system operations halt.
4. Power down the server.
5. Reset the position 2 switch to the default **off** position.
6. Power up the server.
7. Reset all system configuration settings by pressing the **F9** key to run the ROM Based Setup Utility (RBSU).

   See Chapter 5, "Server Configuration and Utilities," or the *Compaq ROM Based Setup Utility User Guide*, for more information on RBSU.

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Redundant ROM Settings

IMPORTANT: Switching ROM images can also be done through RBSU. Use the following procedures when RBSU is inaccessible. For information on accessing redundant ROM options through RBSU, as well as disaster recovery procedures, see Chapter 5, "Server Configuration and Utilities."

To switch from the current ROM to the backup ROM, perform the following steps:

1. Power down the server.
2. Set the system configuration switch positions 1, 4, 5, and 6 to the **on** position.
3. Power up the server. The ROM will beep and halt when the ROM images have been swapped.
4. Power down the server and reset all system configuration switch positions to the default **off** position.
5. Power up the server.

If both the current and previous versions of the ROM are corrupted, see section "Disaster Recovery" in Chapter 5, "Server Configuration and Utilities."

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System ID Switch Settings

The system ID switchbank, located on the system board, is reserved for use by Compaq authorized service providers only. Do not change the indicated default settings.

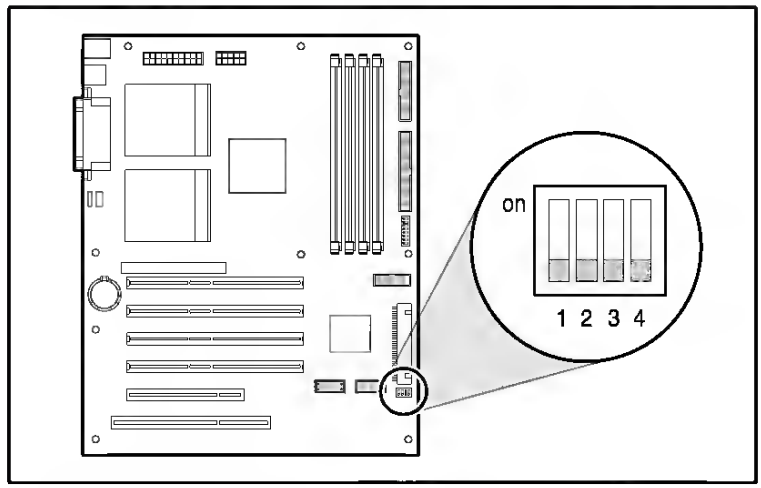

Figure E-5. System ID Switch

Table E-5
System ID Switch Settings

Position	Default	Function
1	Off	Reserved
2	Off	Reserved
3	Off	Reserved
4	Off	Reserved

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Jumper Settings

SCSI Device Jumper Settings

No two SCSI devices connected to the same SCSI controller can have the same SCSI ID. If another SCSI device is connected to the same controller, check its SCSI ID before beginning the installation procedure for the additional device. The SCSI ID is set by jumpers located on each device. For more information, refer to your SCSI device option documentation.

ATA Device Jumper Settings

When installing any ATA devices, make sure that the jumper on the device is set to Cable Select (CS). This option allows the cable to determine which device is the primary drive and which is the secondary drive. For information on cabling ATA devices, see Chapter 4, "Cabling Guidelines."

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Appendix F

Specifications

This chapter provides detailed, specific information for the operation of your Compaq ProLiant ML330 Generation 2 server, including:

- Server specifications
  - Dimensions
  - Power requirements
  - Temperature requirements
- Minimum hardware configuration
- Supported operating systems
- Drivers

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Server Specifications

Table F-1
ProLiant ML330 Generation 2 Server Specifications

Dimensions		
Height	42.0 cm (16.5 in)	
Depth	19.1 cm (7.5 in)	
Width	51.5 cm (20.25 in)	
Approximate weight	15.42 kg (34 lb)	
Input specifications (per power supply)	**U.S.**	**International**
Rated input voltage	100 VAC to 120 VAC	200 VAC to 240 VAC
Rated input frequency	50 Hz to 60 Hz	50 Hz to 60 Hz
Rated input current	6 A	3 A
Input power (Btu/hr)	1,560 Btu/hr	1,560 Btu/hr
Output specifications (per power supply)		
Rated steady-state power	300 W	
Maximum peak power	400 W	
Temperature range (see Note)		
Operating	50°F to 93°F	10°C to 33°C
Shipping	-40°F to 150°F	-40°C to 66°C
Maximum wet bulb temperature	101.7°F	38.7°C
Relative humidity (noncondensing)		
Operating	20% to 80%	20% to 80%
Nonoperating	5% to 90%	5% to 90%

Note: All temperature ratings shown are for sea level. There is an altitude derating of 1°C per 300 m to 3,000 m (1.8°F per 1,000 ft to 10,000 ft).

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Minimum Hardware Configuration

Make sure that your server meets the requirements for minimum hardware configuration. During the troubleshooting process, it may be necessary to reduce your system to its minimum configuration, reinstalling options one at a time to determine the cause of failure.

Table F-2
Minimum Hardware Configuration

Component	Minimum Specifications
Processors	A processor must be installed in processor socket 1.
Server Feature Board	The Server Feature Board must be installed in expansion slot 6.
Fans	A system fan must be installed and connected to the system board.
Memory	At least one slot must be populated with a PC133-MHz ECC Registered SDRAM DIMM.
Note: The maximum memory configuration is 4 x 1-GB memory modules.	

Also refer to the *Compaq ProLiant ML330 Generation 2 Server Maintenance and Service Guide* at the Compaq website:

http://www.compaq.com/support

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Supported Operating Systems

To operate properly, your server must have a supported operating system. For updated information on supported operating systems, log on to the Compaq website:

http://www.compaq.com/products/servers/platforms/

For the latest information on Linux version and support, log on to the Compaq website:

http://www.compaq.com/products/servers/linux.html

CAUTION: If your server has a factory-installed operating system, configure the server using the instructions in the *Compaq Factory-Installed Operating System Software Installation Guide* or data will be lost.

Drivers

The ProLiant ML330 Generation 2 server features new hardware that does not have driver support on all operating system installation media. It is recommended that you use SmartStart and its Assisted Path feature to install your operating system and the latest driver support. If you do not use SmartStart to install your operating system, drivers for some of the new hardware are required. These drivers, as well as other option drivers, ROM images, and value-add software can be downloaded from

http://www.compaq.com/support/files/server

For more information on drivers, refer to "Maintaining Current Drivers" in the *Compaq Servers Troubleshooting Guide*.

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